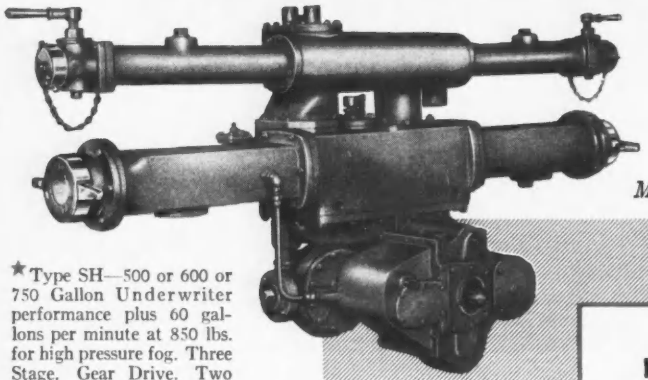
FEBRUARY 1950

FIREMEN

FIFTY-FOURTH YEAR • NATIONAL FIRE PROTECTION ASSOCIATION

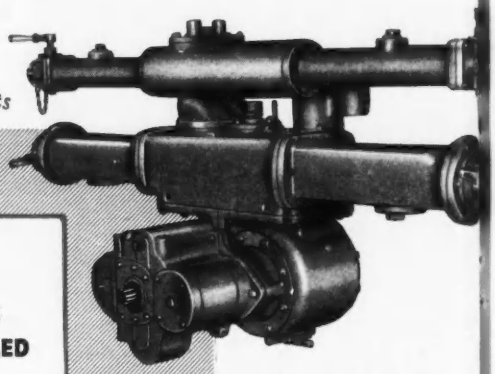
CHAMPION FIRE PUMPS

Write for Booklet on Fire Trucks and Pumps



★Type SH—500 or 600 or 750 Gallon Underwriter performance plus 60 gallons per minute at 850 lbs. for high pressure fog. Three Stage. Gear Drive. Two suction inlets, 4", 4½" or 5". Two 2½" discharge valves (3 on 750 Pump).

Midship Mounts



★Type S—Capacities 500-600-750 gallons per minute at 120 lbs. pressure. Two Stage. Gear Drive. Two suction inlets, 4", 4½" or 5". Two 2½" discharge valves. (3 on 750 Pumps).

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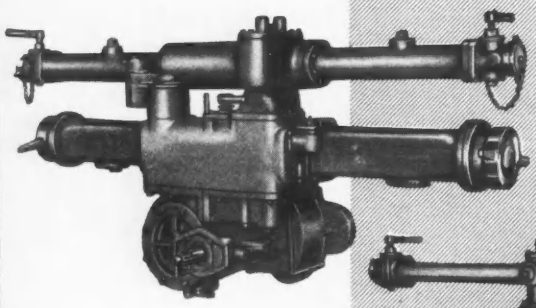
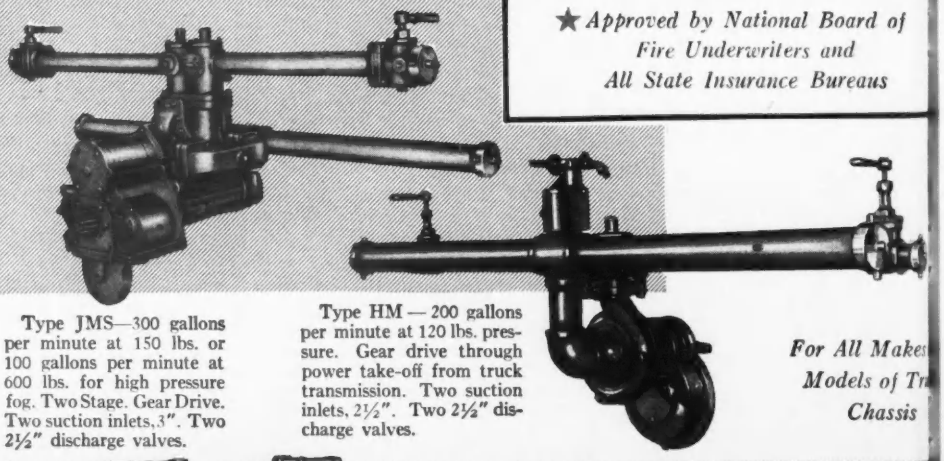
★*Approved by National Board of Fire Underwriters and All State Insurance Bureaus*



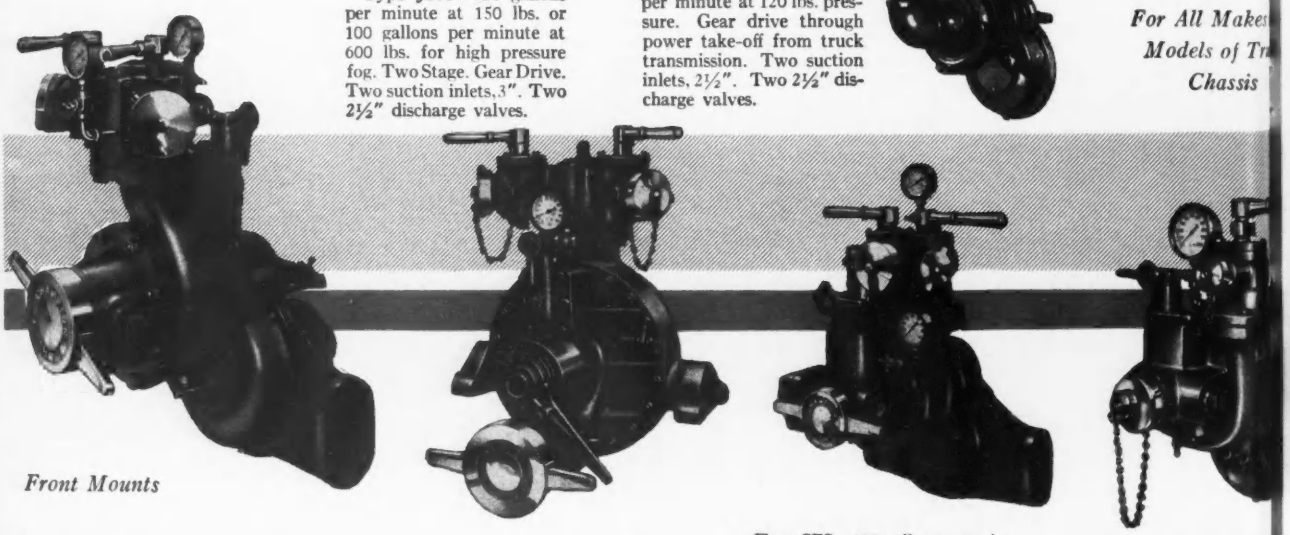
★Type M — Capacities 400-500 gallons at 120 lbs. Gear Drive. Two suction inlets, 3½" or 4". Two 2½" discharge valves.



Type JMS—300 gallons per minute at 150 lbs. or 100 gallons per minute at 600 lbs. for high pressure fog. Two Stage. Gear Drive. Two suction inlets, 3". Two 2½" discharge valves.

Type HM — 200 gallons per minute at 120 lbs. pressure. Gear drive through power take-off from truck transmission. Two suction inlets, 2½". Two 2½" discharge valves.

For All Makes Models of Tr Chassis



Front Mounts

★ Type KF—Capacities 400-500-600 gallons at 120 lbs. Gear Drive. 3½", 4", 4½" suction. Two 2½" discharge valves.

★ Type F — Capacities 400-500 gallons at 120 lbs. Direct Drive. 3½, 4" suction. Two 2½" discharge valves.

Type JFS—300 gallons per minute at 150 lbs. Pressures up to 1000 lbs. Two Stage. Gear Drive. 3" suction. One 2½" and two 1½" discharge valves.

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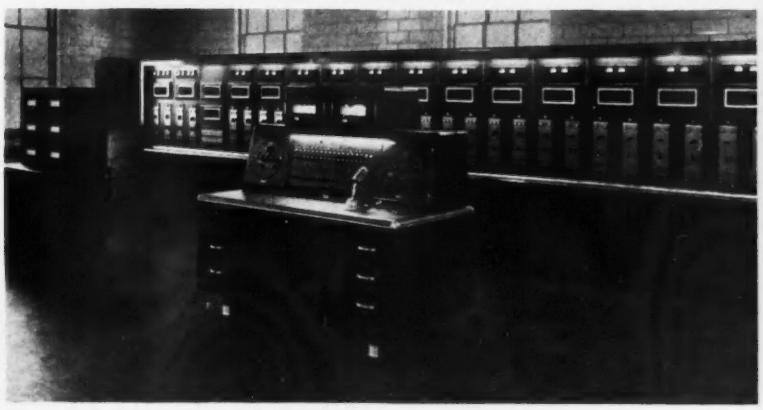

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Minimize water damage by extinguishing fires quickly and efficiently.

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Firemen

Volume 17 Number 2

WARREN Y. KIMBALL, EDITOR
OWEN L. DELLA LUCCA, ASSOCIATE EDITOR
CHARLES S. MORGAN, ADVERTISING MANAGER

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PERCY BUGBEE, GENERAL MANAGER
ROBERT S. MOULTON, TECHNICAL SECRETARY
HORATIO BOND, CHIEF ENGINEER

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Accounts of fires appearing in FIREMEN *are copies of or extracts from reports, forwarded to the Association. This Association, as a body, is not responsible for the statements or opinions of any of its members.*

Acme

Another view of the Hyndman conflagration showing three stages of a fire. At left a building is down to ground level. At center is one heavily involved. At right is one taking fire. A well trained hose crew should be able to black out the fire at the right knocking down the fire on the exposed wall and in the stairway and window at the right. An all-purpose nozzle at strong pressure is excellent for this service, the straight stream raking the exposed wall and window openings from as near as the crew can advance and the fog providing personnel protection. Fires are still lost because inadequately trained persons handling the hose fail to get the pipe within effective range. Even where the heat is too severe to be borne for more than a few seconds the line should be advanced so as to rake the fire even if temporary retreat follows.

THE cover photo (*Acme*) shows the Christmas night conflagration that destroyed the business district of Hyndman, Pennsylvania, not far from Cumberland, Maryland. Some sixty persons were reported homeless but fortunately no lives were lost. The photo shows wires falling from the poles supporting the Christmas street decorations. Note that the fire fighters are driven back so far that the stream appears relatively ineffective in protecting exposed wooden frame buildings. In fighting a conflagration heavy streams are required and aggressive fire fighting is needed to get the water into effective position between the fire and the exposures. One mistake commonly made is to put too much of the water on exposed buildings instead of on the fire immediately adjacent to the exposure. Cooling and slowing the edge of the fire is often of vital importance in stopping this type of blaze. An alert hose crew can keep the line moving, or shift the nozzle, so as to prevent flame from breaking out on exposed surfaces but as much water as possible should be put on the fire in order to prevent its spread and best protect exposures.

A FIRE which occurred in Edmonton, Alberta, in 1949 causing a loss of $1,673,000 resulted in a public investigation of the city's fire defenses. The findings of the court resulted in increased equipment and personnel for the Edmonton Fire Department. "Fire Service News," published by the office of the fire marshal of British Columbia has this to say of the recent inquiry:

"The heavy responsibility of a fire chief is again brought forcibly to our attention in considering the findings of Justice G. B. O'Connor in the recent Edmonton inquiry We refer particularly to Item Two of the report which reads: 'that the fire fighting methods used by the fire department were not in accordance with proper practice or adequate under the circumstances.'

"What were the circumstances? Were there circumstances present that cold midnight when the fire chief and his men arrived that could not possibly be pictured in a courtroom? The fire fighting technique brought into action by a fire department upon arrival and during a fire are based on decisions which must be made on the spot. The chief and his men may be forced to abandon normal proper practice for many reasons. But during a post mortem, when actions at the fire are being debated, how often do we hear of what might have been done! It is infinitely more comfortable, easier, and safer to fight a fire theoretically than under the stress of emergency with all the attendant hazards and obstructions.

"It is not intended to question the findings of the Court, which, of course, concluded on the basis of available evidence and very properly offered criticism directed toward preventing the recurrance of a similar incident. However, the thought persists, that, without intent, an unfair reflection could be cast upon a department doing an excellent job under the circumstances with inadequate facilities.

"However, after noting that numerical deficiencies in both men and machines created, fundamentally, the major part of this unfortunate situation, and regardless of verbal objections and the persuasive mien of some councilors, the lesson which every fire chief might apply when submitting estimates is: 1. Take stock, survey your facilities using standard requirements and practice as a yardstick, and considering the potential growth of your area. 2. Estimate needs in the light of necessity and not in the light of available finances and leave the matter of financial ability to the council."

Little Drops of Water

by Lloyd Layman, Chief
Fire Department Parkersburg, West Virginia

Suggestions as to "more effective and practical methods by which the vast extinguishing power of water can be released and utilized in fire fighting operations" as presented to the Fire Department Instructors Conference at Memphis, Tennessee, January 11, 1950.

SINCE the earliest period of recorded history, man has employed water to defend his life and property from the destructive action of fire. In the course of human progress man has accumulated a vast reservoir of scientific knowledge and has made tremendous progress in various fields of scientific research, even to releasing the energy contained within the atom; yet, he has failed to find any substance or combination of substances which will equal or even approach the effectiveness of water in the control and extinguishment of fire. Why has man failed to find a more effective extinguishing agent than water? It is not because of a failure to search for one. He has found other agents which have proved effective in the extinguishment of fire involving certain types of materials but the combined extinguishing action of all these agents is puny in comparison with that of water. The reason man has failed to find a more effective agent is because water is nature's answer to the problem of controlling and extinguishing fire. Water is the universal extinguishing agent but man has been very slow to developing effective methods of employing this powerful ally in his never ending struggle against the destructive action of fire. To comprehend the vast extinguishing power of water and to develop effective and practical methods of employment, it is necessary to become familiar with the basic characteristics of water and to understand the natural laws that govern its conduct as a controlling and extinguishing agent.

The study of this subject must be approached with an open mind and with the courage to discard antiquated ideas and methods. To those will be offered more effective and practical methods by which the vast extinguishing power of water can be released and utilized in fire fighting operations. Field experience will prove that these methods are not only effective and practical but will provide an increased degree of safety for fire fighting personnel.

Water, in its normal state, is a liquid which can be changed into a solid by the process of freezing or changed into a vapor by the process of boiling. Heat is released from water in the process of freezing while heat is absorbed by water in the process of boiling. With atmospheric pressure equal to that at sea level, fresh water freezes at 32°F and boils at 212°F. At higher elevations the atmospheric pressure is less and its boiling point is correspondingly lower. When water boils it releases water vapor which is known as steam. Steam is a transparent vapor which is not visible to the human eye and remains invisible until the process of condensation begins. Condensation is caused by loss of heat and as this process progresses what was formerly steam appears as a visible mist. This visible mist will be referred to as "condensing steam."

One gallon of fresh water will absorb approximately 1,250 British thermal units (Btu) if its temperature is raised from 62°F to 212°F. This theoretical gallon of water has reached its boiling point (212°F) and is ready to start changing from a liquid to a vapor. Absorption of additional heat will not increase the temperature of the water but will reduce the liquid volume by converting some of the water into steam which will escape into the surrounding atmosphere. In the process of vaporization (boiling), this gallon of water will absorb more than six times the volume of heat that it absorbed in the process of raising its temperature from 62°F to 212°F. When the last drop has been converted into steam, this gallon of water has absorbed a total of 9,330 Btu; 1,250 Btu in raising its temperature from 62° F to 212° F and 8,080 Btu in the process of vaporization. Keep in mind that fire is extinguished by that water which is converted into steam, while that which remains as a liquid has not only been ineffective in its extinguishing action but may cause damage to exposed materials. On the fire ground the effectiveness of the attack can be estimated readily by the volume of condensing steam coming from the zone of combustion.

Water expands into steam at a ratio of 1 to 1,700. In other words, one cubic inch of water expands into 1,700 cubic inches of steam. One gallon of water occupies a total space of 231 cubic inches. When a gallon of water is converted into steam, the steam will occupy a total space of 392,700 cubic inches. This is equal to approximately 227 cubic feet. For all practical purposes and for making rapid mental estimates, an approximate volume of 225 cubic feet of steam per gallon of water can be used. This is one of the most important characteristics of water and second only to its heat absorbing capacity. Here is the key which will unlock the door to a logical solution of some of the most stubborn problems encountered in fire fighting operations.

The most effective and practical method of fire extinguishment is by cooling the involved and exposed combustibles to a degree lower than their ignition temperatures. The ignition and burning temperatures of all ordinary combustibles are above 300° F, therefore, if the involved and exposed combustibles are cooled to approximate temperature of 300°F, the fire has been extinguished. It is a scientific fact that water is the most effective heat absorbing substance which can be employed to effect this cooling action. As I have emphasized, the entire volume of water must be converted into steam to obtain the maximum cooling action. Perfection in the use of water as a fire extinguishing agent would be achieved if water could be applied in a form and at a rate whereby the entire volume would be converted into steam. Perfection is difficult to achieve but it is possible to apply water in a form which will result in the vaporization of a large percentage. This result cannot be obtained by applying water in the form of a solid stream. The solid stream is a very ineffective method of application due primarily to the limited surface exposure of the water in ratio to its volume. Little if any progress can be made in improving the tactical employment of water in fire fighting operations until the gross ineffectiveness of the solid stream method of application is recognized.

The rate of heat absorption can be increased by increasing the surface exposure of a substance in ratio to its volume. This is a simple law of physics which is unknown to advocates of bigger and better solid streams. The surface exposure of a given volume of water can be increased by breaking the water into finely divided particles. The surface area of a gallon of water, broken into finely divided particles, is increased many thousands of times over that of a gallon of water in the form of a solid stream. Water can be broken into particles by passing it through a properly designed nozzle under adequate pressure. The design of the nozzle and the nozzle pressure are the factors that determine the size of the particles. The solid stream will continue to be useful but its field of employment will be extremely limited. The primary method of applying water in fire fighting operations will be in the form of finely divided particles.

Chief Layman, who presents what may prove to be a revolutionary advance in fire fighting techniques, is a member of the NFPA Committees on Firemen's Training and Fire Department Equipment, was commandant of the U. S. Coast Guard Fire Fighting School at Fort McHenry during World War II, is author of the book "Fire Fighting Tactics." Chief Layman's comments should receive careful study and application by all who hope to be counted among the ranks of strictly up-to-date or truly "modern" fire fighters.

FIRES within buildings or other confined spaces are usually the most difficult to attack and extinguish. This is due primarily to the accumulated smoke and heat which retard the progress of extinguishing operations. When these two elements are of sufficient degree and volume, they are not only a serious hazard to the involved building and exposed materials but are also a real menace to the life and safety of the fire fighting personnel. Before complete extinguishment can be effected, these two elements must be reduced in both degree and volume to within a range that will allow fire fighting personnel to operate within the building. In attempting to solve this problem by resorting to conventional methods of ventilation definite risks are incurred. The displacement of the heated smoke by allowing air from the outside atmosphere to circulate through the building will bring into the zone of combustion sufficient oxygen to support flame production. With an adequate oxygen supply, flame production will extend quickly to all combustibles that are heated to or above their ignition temperatures. This may enable the fire to extend its boundaries beyond control of the fire fighting personnel before adequate extinguishing action can be taken. If entry is attempted without ventilating the building the fire fighting personnel, even though they are equipped with adequate respiratory protection, will be confronted with dense smoke which reduces visibility to practically zero. The atmospheric temperature may exceed the degree of human endurance. If a flammable mixture of smoke and air develops within the building a smoke explosion may occur. Although smoke explosions are rare they continue to collect their toll in deaths and injuries from the fire service.

Ventilation of an involved building by allowing ventilating currents to develop through adequate and properly located openings, together with a prompt and well coordinated attack, is a method which was accepted by the fire service only after years of argument. If the atmospheric and surface temperatures within the building are higher than the ignition and burning temperatures of the combustibles, the inherent weakness and serious risks of this method are self-evident and have long been recognized by the fire service. There is a scientific method of attacking fires of this nature. This method is based upon the principles of vaporization of water and condensation of steam. This method if employed properly will displace the heated and contaminated atmosphere, extinguish surface burning, and will reduce the atmospheric and surface temperatures to a degree which will allow personnel to enter and complete the extinguishment of smouldering burning. This is an effective and practical method that will eliminate the risk of smoke explosions. The principles upon which this method is based may be summarized briefly as follows:

(1) Rapid generation of steam within a confined space creates a violent atmospheric disturbance within the space.

(2) Each cubic foot of steam generated within a confined space demands a cubic foot of that atmospheric space.

These principles were discovered by the staff of the Coast Guard Fire Fighting School at Fort McHenry, Baltimore, Maryland, during World War II. The method used to effect extinguishment of fires involving fuel oil within the machinery space of the "Gaspar de Portola" was based upon these two simple principles. Approximately twenty full-scale experimental fires, involving more than 5,000 gallons of fuel oil with a burning surface of approximately 1,800 square feet, were extinguished by this method.

In 1947 I completed my wartime service with the U. S. Coast Guard and returned to the Parkersburg Fire Department. Two members of my Department, Chief Inspector K. C. Tomer of the Fire Prevention Bureau and J. W. Bradford, Department Instructor, had been members of the staff of the Fire Fighting School at Fort McHenry. They also returned to duty with the Department. With the knowledge we had accumulated from the research and experimental work at Fort McHenry and in connection with "Operation Phobos" at San Francisco we were confident that the technique of municipal fire fighting could be revolutionized. Without publicity or fan-fare we set to work laying the foundation within the Parkersburg Fire Department for the change over from the solid stream method of application to that of finely divided particles. An educational and training program was started. This program was designed to enable our personnel to develop the skill and confidence necessary to produce effective results with this method of fire fighting. Every effort within reach of our limited resources was exerted to provide practical training and to procure, design, and improvise the equipment required. The method of "indirect application" was emphazied. This method is based upon the theory of "Indirect Application and Atmospheric Displacement."

THE theory of "Indirect Application and Atmospheric Displacement" is based upon the two simple principles discovered at the Coast Guard Fire Fighting School. This theory assumes that the cooling action of water, applied in the form of finely divided particles within a highly heated confined space, is not restricted to the area of direct contact. Rapid generation of steam within a confined space creates an atmospheric disturbance of sufficient force to distribute unvaporized particles throughout the space. Unvaporized particles are thus brought into contact with heated materials located beyond the reach of direct application. These unvaporized particles are converted into steam thereby cooling the contacted materials and at the same time increasing the atmospheric disturbance within the space. It appears that this action continues until the surface temperature within the space is reduced to approximately 212°F, the boiling point of water. Each cubic foot of steam generated within the space demands a cubic foot of that atmospheric space. The rapid generation of steam increases the atmospheric pressure within the space. A building is not an air tight container, therefore, the interior and the outside pressures are equalized quickly by an escape of atmosphere from the higher to the lower pressure area. If the volume of steam generated within the space exceeds the total atmospheric volume of the space most if not all of the original atmosphere will be displaced by an atmosphere of steam. When the surface temperature within the space has been reduced to approximately 212°F, the boiling point of water, steam generation ceases. Steam within the space starts to condense and cool air from the outside atmosphere enters filling the void created by the process of condensation. This action continues until the entire interior atmosphere consists of air.

The theory of "Indirect Application and Atmospheric Displacement" is the product of observing and studying hundreds of experimental and training fires conducted at the Coast Guard Fire Fighting School. Many hours were devoted to the study of scientific data obtained from experimental fires aboard the *Gaspar de Portola*. It was only after I returned to Parkersburg and had both the time and energy to complete this study that the theory of "Indirect Application and Atmospheric Displacement" took final form. We have developed a method of attack based upon this theory. During the past two years we have had a number of opportunities to employ this method of attack. From time to time we tasted of success but also made many mistakes. Each fire was studied in view of preventing the same mistakes at future fires. As skill and confidence increased and the mechanical difficulties were overcome, this method of attack proved to be both effective and practical.

The essentials of this method of attack may be summarized briefly as follows:

(1) This method is effective only on fires within confined spaces when the atmospheric and surface temperatures are above the boiling point of water.

(2) In making the initial size up care must be taken to locate the area of major involvement and determine the most practical avenue of attack.

(3) The area of direct application is a most important factor in obtaining results from this method of attack. Direct application must be made at the uppermost level within the area of major involvement where the atmospheric and surface temperatures are highest. Either high or low-velocity type of water particles may be employed. Where the attack can be made through a window opening or from an interior stairway below the level of the fire, high-velocity has proved most effective. A fire in an unfinished attic can be attacked by making a small opening in the ceiling of the floor below and inserting a straight applicator equipped with low-velocity head. The applicator should be of sufficient length to place the low-velocity cone at the upper level of the space. Our cellar pipes are equipped with low-velocity heads and are designed to be inserted through a 2½-in. diameter opening. This size is made in a wooden floor or roof by means of an electric power drill equipped with a specially designed saw bit. It takes only a few minutes to make an opening with this equipment.

(4) Personnel should operate from positions which will enable them to avoid envelopment by heated smoke and steam. When the attack is made from the floor above personnel should be withdrawn from the building before water is applied. The flow of water should be controlled by valve located outside of building. When attacking through window opening the nozzleman should stay below the opening to avoid the outrush of heated smoke and steam. The major movement of smoke and steam will be upward and out while the downward movement will be minor in nature.

(5) Indirect application and atmospheric displacement will be obtained only on and above the floor where the water is applied.

(6) The effectiveness of the attack can be recognized by the violent expulsion of smoke followed by a mixture of smoke and condensing steam. This occurs within seconds following the application of water. I have observed this action many times and it always occurs in the following sequence: first — a violent expulsion of smoke, second — a mixture of smoke and condensing steam, third and final phase — condensing steam with little if any smoke.

(7) The progress of the attack can be determined readily by observing the volume of condensing steam coming from the building. A decrease in the volume is a definite indication that complete conversion is no longer being obtained. When the volume of condensing steam has decreased to a noticeable extent indirect application has ceased and the cooling action of the water is restricted to the area of direct application. At this time the application of water should be discontinued and any remaining burning must be extinguished by direct application.

(8) Conventional methods of ventilation may be employed to hasten the process of condensation and to effect a further reduction of atmospheric temperature within the building.

(9) At this time it appears that the following conditions can be anticipated:

(*a*) The residual heat reduced to an extent that will allow personnel to enter and operate within the space. The atmosphere will be hot and humid causing physical discomfort but this appears to be due to high humidity rather than to excessive temperature.

(*b*) Smoke may be present at the upper level of the space but usually of insufficient density to interfere with visibility.

(*c*) Oxygen percentage of the interior atmosphere will be approximately normal (21 percent).

(*d*) Small spot fires and deep seated smouldering may be present.

What is the proper rate of application in this method of attack? This is a difficult question and one for which no definite answer is available at this time. A study of the data obtained from the experimental fires aboard the *Gaspar de Portola* tends to indicate that the rate of application can vary over a wide range without affecting the ultimate results. The machinery space of the *Gaspar de Portola* had a total volume of approximately 85,000 cubic feet, allowing approximately 20,000 cubic feet for the space occupied by machinery and other contents, there remained a net atmospheric volume of approximately 65,000 cubic feet. Most of the experimental fires were extinguished by applying water at a rate of 114 gpm. In one test only 60 gpm were used while in another test 168 gpm were used. Complete extinguishment was obtained in both tests. Where we have had an opportunity to employ this method of attack in building fires, the rate of application has ranged from 50 to 65 gpm. The largest space had a net atmospheric volume of approximately 11,000 cubic feet. With one door and several windows out a volume of approximately 54 gpm was sufficient to produce effective results. I am inclined to believe that a minimum rate of approximately 50 gpm is necessary to produce effective results within spaces of ordinary size. It appears that a faster rate of application would be desirable where larger spaces were involved. Additional experimental work and field experience will be required before a definite formula can be determined.

The total volume of water required in this method of attack is dependent upon the volume of residual heat contained within the space. During the period of rapid steam generation the interior pressure is above that of the outside atmosphere and this prevents the entry of air. This condition plus the dilution of the original atmosphere with steam effects an immediate reduction of the oxygen content within the space to less than the percentage necessary to support flame production. Heat production practically ceases during this period and the heat absorbing capacity of the water is utilized almost entirely to absorb the residual heat contained within the space. A noticeable decrease in the volume of steam coming from the building indicates that the percentage of conversion is decreasing. If the application of water is stopped at the proper time little if any water damage will result. In the fire previously mentioned approximately 125 gallons of water were applied within the house and the "run off" amounted to less than five gallons. In other fires the "run off" has ranged from a high of approximately 10 percent to a low of less than 1 percent.

A "mobile flexible unit" for application of "water particles." These nozzles can be lowered to any position and the four jacks will hold the unit. Each nozzle can be supplied by either two or three 2½-in. lines of hose as desired. The individual nozzles can be removed quickly and attached to window sill, parapet, or other locations.

HAVE we used wetter water in this method of attack? We have used both plain and treated water. At one time I had serious doubt if indirect application could be obtained with treated water. This doubt was based upon the bubbles which are formed when treated water is projected into the atmosphere in the form of finely divided particles. Field experience has removed this doubt and it appears that indirect application can be obtained as readily as with plain water. From a theoretical study it appears that treated water should be more effective than plain water in this method of attack but so far we have accumulated insufficient data to

justify a conclusion. This is another factor requiring experimental work and additional field experience. Our experience with treated water has been very encouraging and I am confident that it will find a definite field of usefulness in fire fighting operations. The major retarding factor to the employment of wetting agents in fire fighting operations is the lack of a suitable proportioner. Until this weakness is overcome many questions regarding the feasibility of employing wetter water in fire fighting operations will remain unanswered.

WHAT nozzle pressure is required to produce effective results in this method of attack? Our pump pressures are calculated to provide nozzle pressures of not less than 100 or more than 125 pounds per square inch. We use the same nozzle pressure to produce both high and low-velocity particles.

We have had a number of opportunities to employ this method of attack during the past year. Several of these fires were of sufficient importance to justify the preparation of individual case histories. Great care has been taken to determine the facts regarding the fire, building, conditions existing at the time of fire, attack and extinguishment, and volume of water used. Each case history contains a discussion and conclusions and is supplemented by a diagram of the building and photographs. The following are the conclusions from one of our case histories:

(1) The most practical and effective method of controlling and extinguishing this type of fire is by the proper application of the necessary volume of water in the form of finely divided particles.

(2) The water particles should be projected upward into the overhead within the area of major involvement. The area of major involvement in this fire was within the area consisting of the kitchen, breakfast nook, and pantry.

(3) It is possible to displace a heated and contaminated atmosphere within a confined space by injecting a sufficient volume of water in the form of finely divided particles providing the degree of temperature and the volume of heat within the space is sufficient to convert the water into steam. This provides a safe, rapid, and effective method of ventilating confined spaces which are heated to a high degree and are heavily charged with smoke.

(4) Under the conditions set forth in the preceding conclusion, it appears that the following results are produced:

(*a*) That surface cooling of the heated materials is effected throughout the area from which the atmosphere is displaced. This results from water particles being carried beyond the range of their original velocity in atmospheric currents generated by the rapid vaporization of water.

(*b*) That the surface temperature of the heated materials will be reduced to approximately 212°F, the boiling point of water.

(*c*) That surface burning will be extinguished but deep seated smouldering will continue.

I have presented only the essential fundamentals of this method of attack. It is impossible to condense this subject into a paper of this length. Some of the statements I have made may be difficult to believe. I can assure you that my statements are very conservative considering the results we have obtained. Do not accept my word for the scientific facts contained in this paper; verify them for yourself, study this entire theory and method of attack with the idea of disproving it. You may find yourself in a similar situation experienced by several civil service fire chiefs employed by one of the armed services. They were ordered to attend a special course of training at the Coast Guard Fire Fighting School — "They came to scoff but stayed to worship."

Can water in the form of finely divided particles be used to effect control and extinguishment of large fires? In my opinion the answer to this question depends upon having equipment that will enable fire fighting personnel to produce, control, and apply large volumes of water in the form of finely divided particles. A large fire developes strong drafts. Air from the surrounding atmosphere is drawn into the zone of combustion at the lower level while heated smoke is exhausted at the upper level. The ingoing air supplies the oxygen necessary to support combustion. It appears that the only logical method of attack would be to utilize the ingoing air to carry water in the form of finely divided particles to the base of the fire. We experimented with this idea at the Coast Guard Fire Fighting School and the results indicated that this theory of attack has considerable merit. If and when my Department is confronted with a fire of a size that cannot be controlled and extinguished with 1½-inch nozzles we intend to employ large volume equipment. We have large volume nozzles mounted on equipment that is both mobile and flexible and designed for either defensive or offensive employment. We can produce, control, and apply approximately 2,500 gpm of water in the form of finely divided particles using these nozzles. I am not asking for a large fire but if one occurs, I am confident that our personnel has the skill, confidence, and determination to test this theory of attack.

This picture was taken the same afternoon as the previous view. The lack of visibility is due to the presence of "water particles." Each nozzle produces 425 gpm at 100 pounds nozzle pressure or 475 gpm at 125 pounds. The 30° angle of discharge gives the best quality of fineness and reach.

British Home Office Issues Civil Defense Manuals

THE British Home Office has issued in looseleaf form two sections of Volume II, Civil Defense Manual of Basic Training, available from His Majesty's Stationery Office, London or from British Information Services, Rockefeller Center, New York City. These manuals are intended to supply information to the general public for their protection in a war emergency and are not to be considered as instruction for defense forces or fire fighters in their own arts or skills.

Pamphlet No. 1, Basic Chemical Warfare (one shilling or 30 cents) deals with war gases including behavior of gases, personal protection, cleansing and contamination.

Pamphlet No. 2 (sixpence or 15 cents) deals with Basic Fire Fighting including fire prevention, escaping from fires, first aid equipment including water and sand buckets, stirrup pumps, and chemical extinguishers. It includes stirrup pump drills for teams of three and four.

Alaska's First Mutual Aid Program

by Lachlan MacDonald

ALASKA'S first mutual aid fire protection agreement was signed on September 19, 1949 by the three major fire-fighting organizations in the Anchorage area. The estimated population of Anchorage itself is about ten thousand, with an additional twelve thousand suburban residents. Add to this several thousand residents at Fort Richardson, about two miles from the city.

There are thirty-six subdivisions on the outskirts of Anchorage, developed and populated since 1943. They have offices, groceries, radio stations, lumber companies, gas stations and other business buildings besides homes and warehouses. Until mutual aid was developed they had no assurance of fire protection. None had advanced to the stage where they could form a volunteer fire department. Fires originating outside the city of Anchorage were handled by the Alaska Railroad or Fort Richardson fire departments if and when they were able to answer alarms. Calls coming to the city were relayed to the department answering calls in that district.

The city was at the time without sufficient equipment or personnel. Responding to calls outside the city would leave the city itself without adequate protection. It was entirely possible that due to distance, weather and road conditions that the meager equipment available might be stranded and of no aid to either the city or outlying districts.

The addition of a 1,000 gpm triple combination pumper considerably changed the equipment problem, and installation of two-way radio equipment in Engine Co. No. 1 allowed the city to respond to some calls without jeopardizing service to the city. Under mutual aid the city is assured of cover by one of the other departments while it answers a suburban alarm, even if a piece of equipment should become stranded or stuck.

Parties to the agreement were Brig. Gen. D. R. Hutchinson, USAF, for the United States Government; Donald R. Wilson, City Manager for Anchorage; and J. P. Johnson, General Manager for the Alaska Railroad.

Since the passage of the agreement any apparatus leaving the city fire station for any great time, or leaving the city limits on an outside call, is replaced by ARR apparatus, which is in turn replaced by equipment from Fort Richardson. In the event of fires outside the city limits the Railroad's 1,000-gallon tanker accompanies or follows the city's FWD 500 gpm pumper, as there are no hydrants or pressure water sources in these districts. The two trucks work in relays while fighting the fire.

All photos Mac's photos

Alaska Railroad firemen assist Anchorage firemen at restaurant fire. Loss was $5,000, mostly smoke.

Fire Prevention Week demonstration at Anchorage fire station at rear of city hall. Siren on tower atop quarters.

SINCE inception of mutual aid the following fires have been extinguished by cooperating departments:

October 3, the city's 500 gpm pumper and its hose truck responded to an alarm at the Alaska Amphibious Airmotive hangar and repair shop at Merrill Field. The field is in the city limits, operated by the city government. The city equipment was supplemented by the Railroad's 750 gpm American-LaFrance, using two 1950-foot lines on the fire. Fort Richardson apparatus stood by at the city station during the fire. Hangar damage was estimated at about $50,000. After 90 minutes the combined departments saved a portion of the building and adjoining structures.

On November 1 there was a fire in the ARR terminal yards, in a cold storage warehouse. City and ARR equipment arrived almost simultaneously. Engine Co. No. 1 and Hose Co. No. 1 of the city responded, laid one 2½-inch line to the fire and brought a 1½-inch line into operation. The railroad used the booster from their 750 pumper and ran two 1½-inch lines from their tank truck. The fire was confined to a single section of the large building, with damage of about $5,000.

A hot stove pipe ignited insulation and got a head start when employees tried to fight the flames before turning in an alarm November 14, at the Alaska Airlines Hangar at Merrill Field. Both city engine companies and the hose company responded. Two 2½-in. lines were hooked up to the 1,000 gpm American-LaFrance at the pump and two lines connected to a hydrant near the hangar. Low pressure at that hydrant on a dead end 6-in. main resulted when the ARR laid two more lines through its 750 pumper. Several lines were shifted to a nearby 100,000-gallon storage tank. Fort Richardson apparatus stood by at the city station until the city apparatus returned. The south wing of the hangar was destroyed at a loss of $75,000 or more. However, the shops and storage area was saved by firemen.

A gasoline fire destroyed a service station outside Anchorage on December 1, when city firemen answered the early morning alarm given by a passing taxi driver who saw the front of the building blazing and radioed an alarm. ARR and city firemen were unable to halt the blaze which had a head start, but managed to snake out several vehicles.

The main problem in the outlying areas is, as before mutual aid, the fact that fires have gotten well under way before firemen arrive. This is due in part to road conditions and distance, but primarily results from lack of communication. Some areas have only one or two phones, some have none at all. To correct this the 1950 budget for Anchorage will include an appropriation for phone extensions in the major suburban areas.

The most outstanding example of mutual aid effectiveness

was given December 5, in Spenard, when a $15,000 apartment home and coffee shop blaze threatened neighboring buildings. On one side it was directly attached to a two-story building housing a plumber's office and lumber company. The lumber owner threw rope lines over the adjoining wing, still under construction, then pulled it away with a 6 x 6 truck. City firemen arrived four minutes after hearing the alarm. They had only 300 gallons of water in a booster tank. With this they held the flames down and wet down the walls of an adjoining grocery store where asphalt siding was already melting.

The ARR tanker arrived 15 minutes after the alarm and wet down the fire in a short time. Without the holding action of the city department the coffee shop, grocery store and lumber storage building would have been lost in a blaze costing probably $150,000. Without ARR supplementary aid the city firemen would have run out of water.

Pertinent clauses of the mutual aid agreement itself are reprinted here for the guidance of interested communities. The first clause sets forth the names of the departments involved and the area to be covered. All departments are required to aid other departments at the request of the fire chief needing assistance. All equipment at the scene of the fire as well as fire-fighting activities will be in charge of the chief in whose area the fire occurs.

No liability may be incurred by the visiting fire departments. None will leave its area unprotected to proceed to the aid of another department. The department dispatching equipment will send one apparatus only unless additional aid is specifically requested. "It is specifically agreed hereto by each of the parties that none of the provisions of this agreement shall authorize payment by one party hereto to either or both of the other . . . for any assistance rendered under these provisions."

The agreement increases the protection available to property assessed at $24 million in Anchorage city, an unestimated valuation at Fort Richardson and Elmendorf Air Force Base, and an estimated $22 million worth of property in the suburban areas which heretofore had little or no actual protection, a total of $45 million assessed valuation.

Anchorage Fire Department

IN JUNE last year fire protection in Anchorage, Alaska, was at a low ebb due to the resignation announcement of Chief George Neal and disbanding of the Anchorage Volunteer Fire Department Association. A new department was promptly formed under George Burns, then Fire Chief at nearby Fort Richardson. The present department includes, besides Chief Burns, Assistant Fire Chief James D. Brown; Captains George T. Hawley and William L. McNutt along with four paid drivers. Nine volunteer housemen are living at the station and there are nine more on-call volunteers.

The Anchorage Fire Department is equipped with four major pieces of apparatus. Oldest in service is a converted 4 by 4 army vehicle carrying 3200 feet of 2½-in. hose and split into a reverse and straight lay, which entered service July, 1946, and costing about $1500.

Engine Co. No. 1 is equipped with an $8,000 triple-combination FWD 500 gpm pumper, carrying 1200-feet of 2½-in. hose, 300 feet of 1½-in. hose, a 300-gallon booster tank and accessories.

The most spectacular piece of equipment is the 75-ft. American-LaFrance aerial ladder truck, with a 500 gpm pump, acquired in March, 1948 at a cost of about $21,000. It carries 800 feet of 2½-in. hose, a 100-gallon booster tank, life net, assorted ladders and various other equipment.

Engine Co. No. 2, delivered in November 1949, is a 1,000 gpm triple-combination American-LaFrance pumper, "Sparton" model, with five-man cab carrying 1400 feet of 2½-in. hose, 200 feet of 1½-in. hose and a 300-gallon booster tank plus assorted assessories. Cost about $19,000.

Tentative plans call for the construction of two additional stations, purchase of two additional pieces of apparatus for residential areas, plus additional full-time personnel to man these stations and equipment.

The addition of equipment has resulted in improved morale among both full-time and volunteer members, a source of friction in previous years. Under Chief Burns the station itself has been cleared to allow inside drills during Alaska's long winters. The latest step has been to draw up a complete report on rules and regulations and present copies to each member.

Department activities include children's parties, school programs and special occasions such as free ice cream, comic books and life net handling demonstrations which attract school children to the station where they become familiar with equipment, fire prevention practices and fire fighting techniques.

Records are now being kept of all fire calls with wall charts to graphically illustrate trends in fire losses.

Alaska Railroad Fire Department

THE Alaska Railroad Fire Department at Anchorage has its quarters and station in the railroad terminal yards about a mile from the city department. It is headed by Chief W. D. McKinney and Assistant Chief Dan Parmenter.

The Alaska Railroad is a branch of the U. S. Department of Interior and the fire department is made up of federal employees, including besides the chiefs, two full-time firemen-drivers and eight part time firemen-watchmen. The eight latter serve as maintenance men. There is also a safety and first aid man.

Equipment consists of one 1000-gallon tank truck carrying 600 feet of 1½-in. hose, fog and foam, and one 6-cylinder 550 gpm pump. The pumper is an American-LaFrance 750 gpm triple-combination carrying 1200 feet of 2½-in. hose and 400 feet of 1½-in. hose, plus fog and foam. A 750 gpm pumper and a 300 tank truck are held in reserve by the department.

The railroad fire force plans to set up direct line communication with the city. It carries on its own fire-prevention program among the 2500 employees. The terminal buildings, shops and storehouses are equipped with direct fire phones for alarm use.

Fort Richardson Fire Department

THE Fort Richardson Fire Department is the largest in the Anchorage area and possibly in Alaska. Thomas I. Thompson is the Fire Chief in charge of six stations, including an airport crash station, aided by assistant chiefs: Paul J. Cunningham, Raymond Bays, Jr., and Robert T. Constance. The department has a strength of 92 persons.

The Fort Richardson department was the first to use wet water solutions in Alaska. All rigs carry the solution in their booster tanks. There are also several tank trucks and numerous types of airport crash fire trucks.

School children visit Anchorage fire department. Mayor Z. J. Loussac, extreme right; Chief George Burns, next; Captain W. McNutt and Assistant Chief James Brown behind girl at right.

Firemen Go to the Schools

By Melvin R. Freeman, Public Relations Manager
National Fire Protection Association

THERE isn't much doubt in any fire chief's mind that the best way to fight a fire is to keep it from starting by promoting an overall, consistent and aggressive year-round fire prevention program. But nowadays our fire prevention program is travelling in pretty fast company.

Worthy as our cause may be, we are in direct competition with other skillfully-planned public service campaigns, all clamoring for attention and you've got to be good even to assemble your audience let alone to do the educational job you are attempting.

You, as firemen, should constantly bear in mind, that like the goods on your grocer's shelves, fire prevention must compete for "sales" with other worthy public service campaigns such as highway safety, disease prevention, bond campaigns and the like. All of the sponsors of these competing campaigns must approach the same informational channels as you.

The time has long passed that because we have a good cause, people are compelled to listen or act simply by the worthy nature of the appeal.

For example, during one recent Fire Prevention Week period there were 13 national campaigns running simultaneously. To be sure that a great percentage of these were commercial promotions, running the gamut from Eat More Succotash Week to Better Layettes for Babies Week but still there were some very worthy drives and the sponsors were trying just as hard to "put over" their particular causes as we were in fire safety.

And this competition, if you want to call it that, gets increasingly intensive when you approach the schools as an important informational center. And approach the schools you must as an important part of your overall annual community fire prevention education job.

FIRE preventionists, at long last, are becoming convinced that unless we educate the citizen of tomorrow — our youth — while they are in the formative stage of their development, we will never win the battle with needless fire.

The great value of juvenile fire prevention education is pretty apparent but just "for the record" let's summarize some of the more important benefits your fire department gets automatically by working with your local schools.

1. One of the most effective ways to place fire prevention material in the home is to have the child bring the material home with him from schoo'. In the NFPA we have distributed millions of the Junior Firefighter's Report, which is a home self-inspection blank for school use. It would take a pretty hard-hearted parent not to accompany Junior 'round the house on a school-assigned home inspection. These youngster *demand* that fire hazards be corrected and if Mom and Pop like to "know all the answers" as they usually do, they will "bone" up on fire prevention.
2. It is a known fact that a good percentage of set fires are caused by children. Fire has almost a hypnotic attraction for the young. Good fire prevention education will cause children to respect fire and not play with it.
3. Unfortunately many of the schools in our country are "firetraps." Seven schools in this country are attacked by fire each and every day of the year. If schools preach fire prevention they will have to practice it also.
4. Most of us are able to spell adequately or add two and two because in our early school years we were well grounded in these subjects. If these arts acquired so long ago stick for such a long time there's no reason that fire prevention wouldn't too.
5. Hazards uncovered as a result of the youngsters' self-inspections are a potent force in reducing the local fire rate. I will talk more about this a little later. And emphasis on fire prevention is a distinct factor in decreasing false alarms known to be "pulled" by school children.

Add all of these benefits up and you will get a very impressive cash total alone. You know what it costs you to make an average "run"; in many communities the lowering of transmitted false alarms alone would justify more work with schools.

Why then if the benefits are so numerous and far-reaching do not all fire departments work closely with their schools? Why do firemen blanch at the thought of putting on a school assembly yet advance unafraid beneath the shadow of a crumbling wall at a 5-alarm fire?

Basically, many fire departments have avoided working with their schools as they would the plague because (1) They felt that any juvenile program would be expensive and (2) They feel that school authorities give them a "royal tossing around" when they approach them.

Let's tackle that objection of expense first. Perhaps the most sensationally successful juvenile fire prevention project in the country is the Junior Fire Department of Los Angeles, covering 33,000 students in the 5th and 6th grades in that community. The organization is sponsored jointly by the Los Angeles Fire Department, the Junior Chamber of Commerce, and the Board of Education. The Junior Chamber of Commerce raises the funds for the program each year which amounts to about $7,000. If Los Angeles can put on such a super-duper program for such an amount, it stands to reason that the cost to smaller communities would be much less. In fact some of the juvenile educational projects should not cost a dime except the time involved in planning and executing them.

Objection No. 2: The feeling by fire departments that schools don't meet them "half-way" when they approach them is a little more difficult to answer. It's more difficult because it involves two more or less self-sufficient community bodies. Fire prevention cooperation is not essential to the daily operation of either the schools or fire department. Therefore, there is a human tendency in a situation like this for both parties to approach the subject of juvenile fire prevention in an off-hand manner, at least initially.

In this case I think the onus is on the fire department. It is probably true that there are some extremely crochety educational authorities and it's probably also true that there may be too much red tape in larger school departments but by and large the educational people are sympathetic toward doing something about preventing fires. In fact, and this is an important feature that you will all want to remember, 23 states at present have direct or indirect statutory legislation requiring the teaching of safety education in the public schools. For example here is how the law reads in California:

"The governing board of each high school district shall prescribe a suitable course of fire prevention for all pupils enrolled in the day high schools of the district. The purposes of the courses of fire prevention shall be as follows: (a) To create an understanding of the cause and origin of fires (b) To emphasize the dangers of carelessness and neglect in homes and public buildings and the necessity of care in the use of fire (c) To promote an interest in preventing fires and the protection of lives and property."

TOO many fire departments only think about their schools for Fire Prevention Week. Without any too much imagination they will approach the schools with a hastily-conceived plan a few days before Fire Prevention Week begins and then wonder why the school people are not enthusiastic. The days

Delivered at 22nd Annual Fire Department Instructors Conference, Memphis, Tenn., Wednesday, January 11, 1950.

are not getting any longer and today our schools are overcrowded and burdened with heavy classroom schedules. There are all sorts of specialized courses and all sorts of appeals from outside educational groups to add to the school's already heavy extra-curricular programs. And it doesn't make the school authorities any more receptive to add to their present burden when they know that the bartender down at the Three Deuces gets twice as much salary as they do for half as much work. Like any other busy group, when the schools are approached they want ideas that will fit easily into their curriculums.

My plea this afternoon is for you to show the same sympathy for the school's problem as you would expect them to show to yours in the fire service. Like any community project, fire prevention necessitates an intelligent meeting of the minds of such community leaders as the fire chief, the school superintendant, etc. The fire department may call the signals if you want to use football talk, but if you're going to put the fire safety ball over the goal line it's a team job.

Your local educational authorities are on your side. But plan your fire prevention program with your schools well and early. You know what's burning and why and how to overcome it. Your local educators are expert in taking information and translating it in proper form for maximum effectiveness for their students at the various age levels. Team up!

Educators want the help of the fire service in intelligently planning fire prevention programs. Here's a quote from the August 1949 California State Department of Education Bulletin:

"Careful planning and periodic evaluation is necessary in developing a good fire prevention program. Frequent checkups should be made to see that children have experiences in the field of fire safety with some degree of continuity and in terms of their maturity levels. Numerous community organizations are able and willing to cooperate with the schools in developing practical fire prevention plans.

"The better types of fire prevention programs observed in secondary schools have been developed by joint planning and cooperation between the schools and the local fire department. While there is evidence of additional need for materials for fire prevention instruction at the student level, there is no lack of professional guidance in the development of good fire prevention programs."

THERE was a time that if a school wanted to do something about fire prevention they usually put on a Fire Prevention Week assembly and let it go at that. Or if some individually ambitious teacher wanted to discuss fire prevention in her particular course she would use up the time some rainy Tuesday afternoon with a cut-and-dried recitation of fire losses and their remedy. And if you will remember, this was one of the appropriate times during the school year to play "hooky."

Now educators have an entirely new slant on teaching fire prevention. They now believe that if the fire prevention message is to get across . . . and stick . . . it must be integrated throughout the various subjects in the school curriculum.

Here's what one prominent educational consultant had to say about this very thing recently:

"Opportunities for the inclusion of education in fire prevention abound in existing secondary school curriculums. The social studies may include teaching for fire prevention in the study of housing, consumer problems, economics, and problems of community planning and development. Shop courses offer practical opportunities for fire prevention practice, since motors and power tools if not properly maintained are hazardous and the daily accumulation of waste materials creates a fire hazard. Health and physical education classes may properly be concerned with fire prevention as a means of protecting persons from injury and death. Homemaking classes may wish to discuss the flammability of certain clothing materials, the proper methods of using flammable liquids and such things as the inspection and simple repair of faulty electrical appliances. Science classes may learn important facts to strengthen their fire prevention knowledge through the study of heat, spontaneous ignition and the principles of fire control by chemical and physical means."

Junior fire marshals and classroom wardens of the Memorial Junior High School of Orlando, Florida, shown receiving instructions from Chief M. G. Bennett whose school fire prevention program made headlines with hazards uncovered and corrected.

The places for painless and thoroughly effective fire prevention education are almost limitless in the school curriculum but fire prevention must be properly integrated and planned at the time the school schedules are being made up. I think that the fire chief that is seriously interested in seeing that his citizens of tomorrow are better equipped to prevent fires could very advantageously make an appointment with his school superintendent when classroom schedules are being prepared.

Naturally there is much to be done on a national scale. The field of juvenile fire prevention education has been barely scratched. The National Fire Protection Association through its Committee on Elementary Education is working with such agencies as the U. S. Office of Education and particularly the National Educational Association. We've got to have more fire prevention textbooks and more supplementary text material. More printed materials will have to be designed, particularly for school distributions at the various age levels. More teachers will have to be indoctrinated at colleges and normal schools about the importance of integrating fire prevention in their particular subjects. Industry will have to make available more fire control exhibit materials, particularly for the science courses.

But perhaps the most important job is yours as the contact man with your local schools in the highlighting and development of existing materials for effective local use.

The day is not too far off when every fire department, be they paid or volunteer, will have their own public relations division and under the public relations officer there will be a specialist whose main job will be to maintain proper year-round liaison with the local schools. Specially selected and trained firemen will be assigned to school work. No longer will fire departments handle their juvenile assignments almost as a punishment detail, as so many now seem to do. The firemen that show up for school appearances will be thoroughly expert in how to hold and best instruct their young audiences.

And I'd like to interject one thought here. Another potent reason for fire departments to do more with the young folks of their community. I had a very interesting letter recently from a Texas fire chief, who was having a hard time interesting good men in the fire service as a career. He thought that some project like a junior fire brigade would develop good prospects for his fire department. And there's an awful lot of merit in that idea.

Concretely, what have been some of the results in communities that have cooperated with their schools for better fire prevention?

A spokesman for the Los Angeles Fire Department had this to say at the 52nd Annual Meeting of the NFPA:

(*Continued on page 24*)

Whittier Junior High School Fire

The Dalles, Oregon

By Chief Charles Roth, Jr.

OUR department experienced a most interesting fire on Thanksgiving morning in which the value of pre-planning and exploiting of waterfog lines to the fullest extent paid off.

At 2:45 A.M., November 24th, a verbal alarm was received for a fire in the Whittier Junior High School. This building is located on a hill about one-half mile from our station. A standard first alarm assignment responded consisting of Engine 1, Truck 1, Booster 1, together with 4 companies numbering 34 men. On arrival the fire was already breaking through the west roof. The entire attic area appeared to be involved, with fire also showing in the two west classrooms on the second floor.

The building was built in 1898 and is 100 ft. long and 65 ft. deep of brick, wood-joisted construction. Access to the inside is via front and rear doors which open into a large central hallway with central stairways going to the second floor. The building had undergone extensive remodeling about 2½ years ago when the ceilings were lowered throughout the structure and a vegetable-fibre board used for covering. The wiring was replaced at that time with conduit and all circuits were properly fused with 15 ampere protection.

The roof structure is the Mansard type and is all open without draft curtains or firewalls in the large attic area.

The original heating was from two wood-fired furnaces located in the basement at the east and west ends and hot and cold air ducts run vertically between classroom walls to serve classrooms above. At the time of the remodeling these interior exposures were ordered firestopped at each floor in-asmuch as the old heating system was abandoned. Central heat is now furnished from a steam boiler in the nearby high school building. We were assured that this would be done but investigation after the fire revealed that it was not.

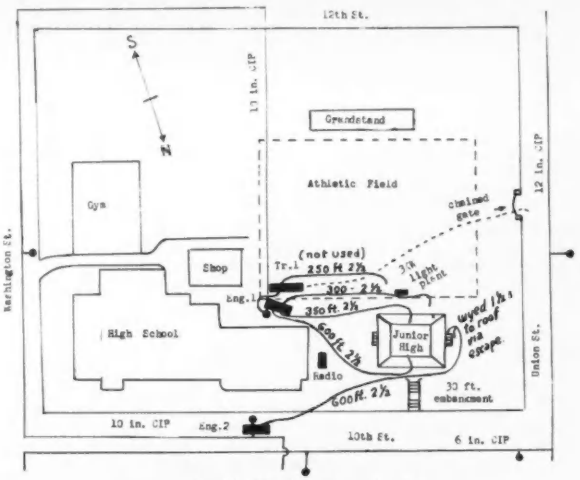
The roofing material was heavy fire-resistive composition on the sloping portion and lock-seam metal on the flat top part. With the discontinuance of the hot air furnaces the vertical shaft area formerly housing the heating ducts was not required so closets and cupboards were built into this space.

The fire started in one of these closets on the second floor and spread upward through the frame ceiling to involve the false ceiling of the classroom and thence into the large open attic. The fire had burned for a long period of time before discovery as was evidenced by the deep destruction to the heavy timbers, and by the behavior of the electric clocks. Four classroom clocks were operated on the same circuit that supplied the lights in the room where the fire started, room 209. The support for the clock in room 209 burned away and the clock fell to the floor at 1:30. In room 208 the support for the clock failed at 2:33 and it also fell to the floor. Strange as it may seem, both of these clocks when tested later at the fire station, were still in operating condition and started under their own power when plugged in. The clocks in the two rooms below stopped at 2:38 which exactly placed the time when this circuit failed and blew the fuse protecting it. It is evident that the fire burned with considerable vigor prior to 1:30 A.M.

One and one-half years ago fire escapes were finally installed on the building to serve all second floor classrooms, only after repeated fire department orders to do so. At that time all the classroom doorway transoms were ordered closed with fire resistive materials. Firemen's ladders were installed on both fire escapes extending to the roof.

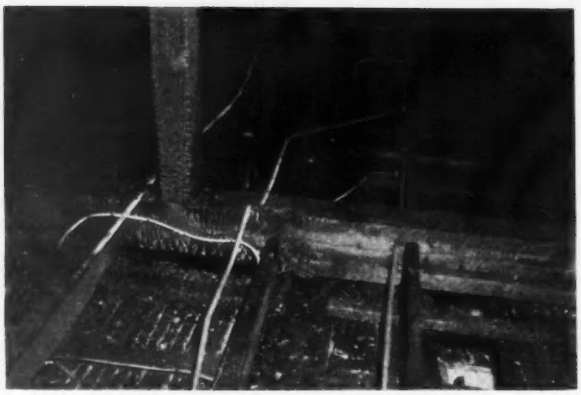
Immediately on arrival of the first alarm assignment it appeared evident that another engine would be required so a radio call ordered our remaining 600 gpm pumper. Because the school is located on a level 30 ft. above 10th Street, the hydrant located in the school yard near the athletic field was the most practicable for the first pumper to use. Access to this hydrant is via a narrow roadway back of the high school

(*Continued on page 23*)



Fire fighting layout employed.

Room 209 looking toward closet where fire started. First line came through doorway at right. Electric clock hung from burned out portion of wall. Fire went aloft from closet to totally involve large attic. Note fibreboard drop ceiling.



Attic over the closet where the fire started. The deep destruction evident in this picture existed throughout the attic area. The Mansard roof trusses were completely destroyed on the west side with partial destruction as the fire traveled eastward.

View of Whittier Junior High School taken at daybreak after apparatus had returned to quarters. Firemen on watch detail examine roof. The composition roofing belies the heavy damage to attic and roof structure underneath.

How Received: Phone ☐ Radio ☐ Box ☐ Verbal ☒

The Dalles Fire Department
Pumper Performance Report

Type Alarm SIREN No. 66-49

Date 11-24-49 Time 0245 to 0715 Location 110 East 10th Driver JBP

Occupancy Junior High School Construction Brick-joist No. Floors 2

Origin of Fire closet room 209 Extent rooms 209-208, and attic thru roof

Cause #28 Owner School Dist. #12 Address City

Occupant(s) Whittier Junior High School, Ray Hotka, prin.

Pumper No. Eng. One Rated Capacity 600 How employed: Draft ..... Hydrant X Line ..... Booster .....

Location of Pumper Northeast corner Athletic Field

No. Lines Connected Three No. Streams Supplied 3 - 4 Hand X Heavy .....

HOSE LINE DETAILS

No.	Primary Size	Primary Length	E. P.	R. P. M.	Res.	How Employed	Secondary Size (layer)	Secondary Length	Elev.	Size Noz.	N. P	G P M
1	2½	600	135	1200	60	Fog	2-1½	100ea.	25	MAP	100	120 ea.
2	2½	350	135	1200	60	Fog			25	MAP	100	120
3	2½	300	135	1200	60	Solid			0	1"	83	270
4												

(over)

Front view of one of the Pumper Performance Reports turned in on this fire. The back (not shown) gives pumping time, gasoline used, water used from tank if any, and discusses effectiveness of streams.

K.F.-148

CITY OF The Dalles, Oregon No. SIREN

FIRE INVESTIGATION REPORT
FIRE MARSHAL'S OFFICE

Location 110 East 10th Street Occupancy Junior High School

Date 11-24-49 Time 0245-0715 Signal Verbal Co. Eng. 1, Eng. 2, Trk. 1, Booster

Cause of Fire or Alarm #28 Investigators Lt. Tucker, Chas. Roth Jr.

Ranking Officer Roth

Total Value Involved	73 718 13	Total Amt. Ins. Involved	73 718 13
Total Amount of Loss	15 940 13	Total Amt. Ins. Paid	15 940 13

Building

Owner School District #12
Address The Dalles, Ore Tel. 3165
Bldg. Agent Dave Bates, Supt.
Ins. Agent Insurance Exchange
Ins. Company Various
Adjuster

Value of Building	73 718 13
Ins. Carried on Building	73 718 13
Ins. Paid on Building	14 835 78
Loss on Building	14 835 78

Contents

Owner School Dist. #12
Firm Whittier School
Address 110 E. 10th Tel.
Ins. Agent Insurance Exchange
Ins. Company Various
Adjuster

Value of Contents	included in bldg
Ins. Carried on Contents	"
Ins. Paid on Contents	1 104 35
Loss on Contents	1 104 35

Construction of Bldg. Brk-jst. Class: No. of Stories 2 Roof Covering comp & metal

Fire originated closet room 209

Fire confined to extended to attic & roof

Complaints Inspector Abated? Date of last inspection Remarks:

Front side of the Fire Investigation Report on the Junior High School fire.

TURN YOUR "DAYS OFF" INTO EXTRA INCOME!

(in a business you know)

Sell RANDOLPH Extinguishers
$84 A WEEK FROM 2 SALES A DAY

You can earn "extra" income easily, *in a business you already know,* by selling Randolph CO_2 Extinguishers to factories, homes, garages and hundreds of other prospects. Read our ad on page 26 and then write for the plan that's earning big money for fieremen and fire officials all over the country. WRITE TODAY!

SEE PAGE 26

RANDOLPH LABORATORIES, INC.
5 E. KINZIE STREET
CHICAGO 11, ILLINOIS

NEW VOLUNTEER FIRE COMPANY DECALS

NOW! a low cost way to identify yourself with your Fire Co.

Now every member of your volunteer fire company can have this richly-colored 4¼ x 3½" authentic decal with your fire company's name and address printed at the bottom panel.

Lots of 100 only 35c each. Order today, or write for further information.

UNITED STATES DECAL CO.
P. O. BOX 193 WILLIAMSVILLE 21, N. Y.

What a Good Looking Fire Engine!

They ALL are, when NEW. But, after 5 years . . . will the finish look dull, color fading, paint peeling, and excessive chipping with rust showing? Not if it is built by American LaFrance. Fourteen process operations are required to meet American LaFrance standards of quality.

THERE IS EXTRA VALUE IN AMERICAN-LAFRANCE FIRE APPARATUS

All bare metal thoroughly cleaned with solvent, steam and compressed air.

First primer and sealer coat applied over all surfaces.

Second primer coat is applied for added coverage and body.

Third coat of primer and sealer gives proper foundation for color.

Water sanded by hand and machine to a perfect base for color coats.

First color coat is applied. Red is shown, other colors when specified.

The second color coat is applied in the series to build up the body.

The third color coat begins to show final color.

The fourth color coat is all some fire departments specify.

The fifth color coat adds depth and body for longer finish life.

The sixth color coat gives added body. No fading with toludine dye.

Wet gas sand by hand with No. 360 for final color coat.

Final color coat for maximum durability in fire service.

Final polish for the gloss and depth of color that has no equal for quality.

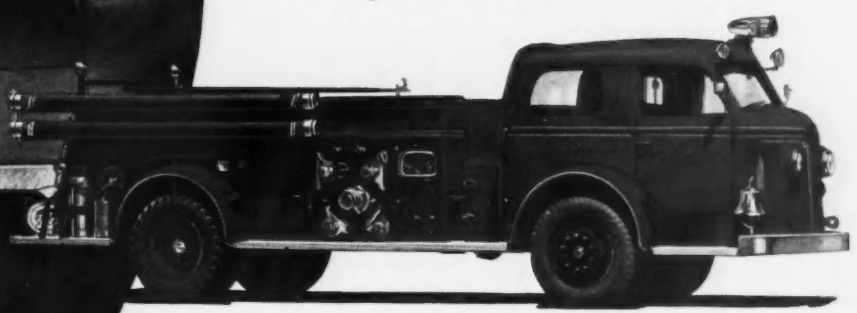
14 different operations and 10 coats of paint provide these extra values

1 **DURABILITY**—The Extra base coats provide a bond between the metal and color coats that assures permanence and freedom from chipping or peeling. All bodies, cabs, water tanks, fenders, side steps, and aprons are fully primed before assembly.

2 **NO FADING**—A maximum of color permanence is provided with toludine dyes. No mineral color pigment to oxidize and fade. After years of service you can still match ALFCO colors. No better paint at any price.

3 **NO DIRT**—Or dust in the standard finish of American LaFrance fire apparatus. Many coats of medium thickness, fast drying under controlled application, eliminate potential causes of paint failure.

4 **EASE OF REPAIR**—Accidents may happen to cut or scrape a finished surface that will require repair. American LaFrance finish permits repair without stripping or removal of finish from an entire panel or fender.



The METROPOLITAN, 1250 g.p.m. pumper.

First in a series of advertisements featuring the EXTRA VALUES in American LaFrance fire engines.

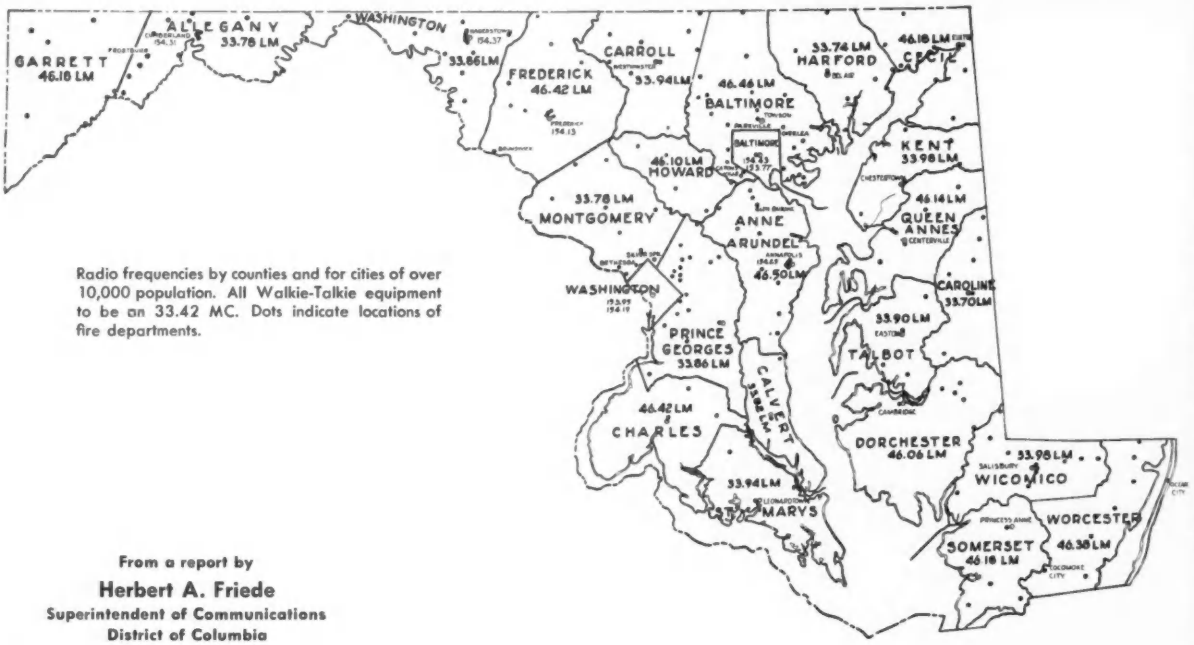
AMERICAN-LAFRANCE-FOAMITE CORPORATION

ELMIRA, NEW YORK, U. S. A.

LAFRANCE FIRE ENGINE AND FOAMITE LIMITED

TORONTO 9, ONTARIO, CANADA

A Frequency Assignment Plan for the Fire Radio Service of Maryland



Radio frequencies by counties and for cities of over 10,000 population. All Walkie-Talkie equipment to be on 33.42 MC. Dots indicate locations of fire departments.

From a report by

Herbert A. Friede

Superintendent of Communications

District of Columbia

THE Fire Service is one of the Public Safety Radio Services covered by the Rules and Regulations of the U. S. Federal Communications Commission, Part 10.* Every Fire Department should secure a copy of Part 10 of the Federal Communications Rules and Regulations. These rules are detailed as to procedure to follow when the use of radio is contemplated. This national allocations plan is for the use and guidance of all technical allocations advisory committees, and has the full indorsement of the fire service of the state of Maryland.

The Federal Communications Commission made the following frequency channels available to the Fire Service, effective July 1, 1949. Frequencies are available in the 152–162 Mc band, six of these are assignable to base and mobile stations and five for mobile only. In addition to the above there are channels available which can be shared with the railroad service between 159.51 and 161.79 Mc for base and mobile stations.

Frequencies 166.25 and 170.15 Mc are assignable to base and mobile stations in the fire radio service at points within 150 miles of New York City. There are frequencies assignable to the fire radio service in the 30 to 50 megacycle band, and also frequencies in the 72 Mc band provided the latter provide no harmful interference to television stations.

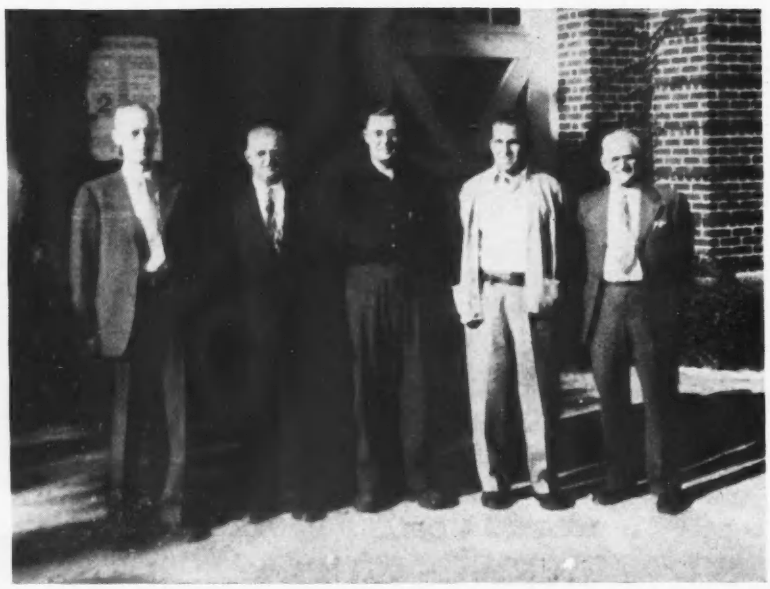
Three low power walkie-talkie frequencies are allocated on a state basis so that all fire departments regardless of their base and mobile frequency can be mobilized at a given point on large fires and a radio coordination service established. This will prove very effective in mutual aid work in time of disaster when large numbers of units from different departments are called for assistance. It will also prevent the disruption of sta-

*Copies of Part 10 of the Rules and Regulations in detail can be secured from the Superintendent of Documents, Government Printing Office, Washington, D. C., for the price of ten cents.

See also FIREMEN for August 1949, page 8. July 1949, page 19.

Maine's State Firemen Training Instructors

Shown below are the men conducting the Maine firemen's training program in cooperation with the State Department of Education. Below, left to right, are: Maurice Varney, Supervisor, State Department of Education; Chief Arthur Emmons, Saco; Assistant Chief Ed. Pullen, Oakland; Assistant Chief Fred Hammond, Sanford; and Chief Allen Payson, Camden. Eight hour courses are given in simplified hydraulics, hose and ladders, ventilation, forcible entry, fire department knots, use of small tools, extinguishers. Local classes are allowed to choose the subjects they think will be most helpful. Certificates are given to men completing each course. Last year classes were conducted in Aroostook, Hancock and Waldo counties.



tion to mobile service when pack sets are in use at a fire.

Inasmuch as there are only three frequencies set aside for the exclusive use of walkie-talkie type equipment, nothing could be gained by an area assignment plan and all three frequencies should be used to greatest advantage on a state wide basis. Fire departments can use walkie-talkie equipment even though they have no station or mobile radio.

Like other classes of users in the mobile radio services, the fire service has set up a frequency allocation plan on a national basis which will result in the most effective use of the available channels with a minimum of interference between systems. Frequencies in the 152–172 Mc band can be dispensed on a purely local pattern since skip interference due to skywave propagation is practically non-existent. Frequencies in the 30–50 Mc band, on the other hand, must be allocated on a national basis with a view of minimizing the skywave interference which occurs periodically between systems operating in this band.

The frequencies in the 30 to 50 Mc band as shown on the map have been allocated on a county basis in Maryland to provide individual radio systems to any and all fire departments in the various counties of the state, regardless of size.

An assignment plan designed to reduce skywave interference in the 30–50 Mc band has been published in pamphlet form by the International Association of Fire Chiefs, 22 E. 38th St., New York City (25c per copy).

VOLUNTEER fire departments have the problem of summoning their personnel at any hour of the day or night with a minimum of annoyance to the local inhabitants and this problem can be solved very nicely by the use of radio. At the home or office of each volunteer an AC operated receiver with sclective signaling equipment can be placed so that when an emergency arises, a particular individual or group of individuals can be alerted without disturbing any of the unneeded personnel. This type of signalling can be added to the standard alarm service and can be so arranged as to trip the local siren or air horn for public alarm devices.

In certain areas or sections the International Municipal Signal Association has set up radio allocations advisory committees, who will assist the various fire departments on engineering problems and interpretation of this assignment plan. These also furnish necessary frequency clearances as required under section 10.57, Part 10 of the F.C.C. rules governing Public Safety Radio Service.

In accordance with the national fire service allocations plan, the cities in

(*Continued on page 26*)

"I like Scott Air-Pak because:

...it gets into action immediately, then helps me get to the source of a fire quickly and safely.

Keeps me comfortable and confident while I'm working under tough breathing conditions. And I sure like the supply of cool, refreshing *air* it gives me. It keeps me pepped up even when the going is rugged."

See your Scott distributor for FREE DEMONSTRATION of Scott *Air-Pak*, or write us *today* for full details.

Have You Seen The New Scott DEMAND Oxygen Inhalator?

ESTABLISHED IN 1932 Scott FOR SAFETY—FOR SERVICE

SAFETY EQUIPMENT DIVISION

SCOTT AVIATION CORP.

236 ERIE ST. LANCASTER, N. Y.

In Canada: Safety Supply Company, Toronto, Ont.

Metcalf
UNIFORM
FABRICS
Standard fabrics for over eighty years

TRADE MARK REG U S PAT OF

ASK TO SEE 386-9
9 oz. Tropical weight in superior 386 quality
Suitable for Uniform Shirts

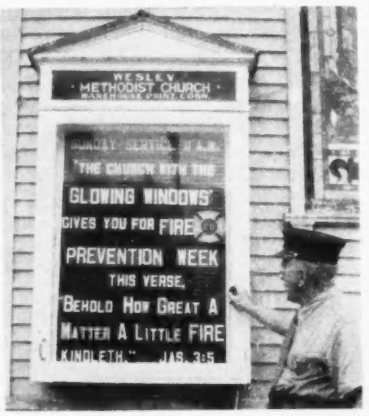
SPECIFY
386
AND OTHER STANDARD NUMBERS USED BY FIRE DEPARTMENTS OF LEADING CITIES

★

Sample Brochure Upon Request

METCALF BROS. & CO.
45 EAST 17TH STREET
NEW YORK CITY

Church Bulletin Board Carries Fire Protection Text



Many clergymen are enthusiastic volunteer firemen. The Reverend Leon T. Burr, shown above at the bulletin board of the Wesley Methodist Church of Warehouse Point, Connecticut, is no exception. Before coming to Warehouse Point, Mr. Burr was Financial Secretary of the Haddam Volunteer Fire Company of Higganum for 15 years and where he is a life member. He is an honorary member of the Hartford County Protection Association. Whenever the trucks roll, Reverend Burr resumes the roll of an active fire fighter.

●

New NFPA Book on Hospital Fire Safety

SINCE the Effingham, Illinois, hospital fire disaster last April there has been an awakened interest in hospital fire safety. NFPA publications on various phases of this subject have been in very great demand. Accordingly, the NFPA has now published a 136-page book (6 x 9 in. page size) including a compilation of previously published NFPA material on this subject supplemented by new items. The cost is $1.50 per copy.

The contents include:

HOSPITAL FIRE SAFETY
Paper by Roy Hudenburg, Secretary, Council of Hospital Planning and Plant Operation, American Hospital Association. Presented at Northeastern Conference NFPA, Buffalo, November 1, 1949.

THE TRAGEDY OF ST. ANTHONY HOSPITAL
Report of Effingham, Illinois, hospital fire, April 4, 1949. By James K. McElroy, Assistant Technical Secretary, NFPA. Reprinted from the NFPA Quarterly.

OREGON MENTAL HOSPITAL FIRE
Account of hospital fire, Fairview Home, Salem, Oregon, May 18, 1949. Reprinted from NFPA Quarterly, July 1949.

HARTFORD CHRISTMAS TREE FIRE
Account of fire in Niles Street Convalescent Home, Hartford, Conn. Reprinted from NFPA Quarterly, January 1946.

HOSPITAL FIRE RECORD
Reports and analysis of earlier hospital fires extracted from Fires in Hospitals and Institutions, NFPA.

PLANNING FOR FIRE SAFETY
Summary of fundamentals of fire safety reprinted from Fires in Hospitals and Institutions.

BUILDING EXITS CODE
Reprint of provisions on hospital exits and related features of life safety from fire, together with extracts from other sections of the Code, giving details for stairways, horizontal exits and like features needed for application of section on hospitals, extracted from Building Exits Code, Tenth

HOSPITAL OPERATING ROOMS
Reprint of NFPA Standard, No. 56, Recommended Safe Practice for Hospital Operating Rooms, 1949.

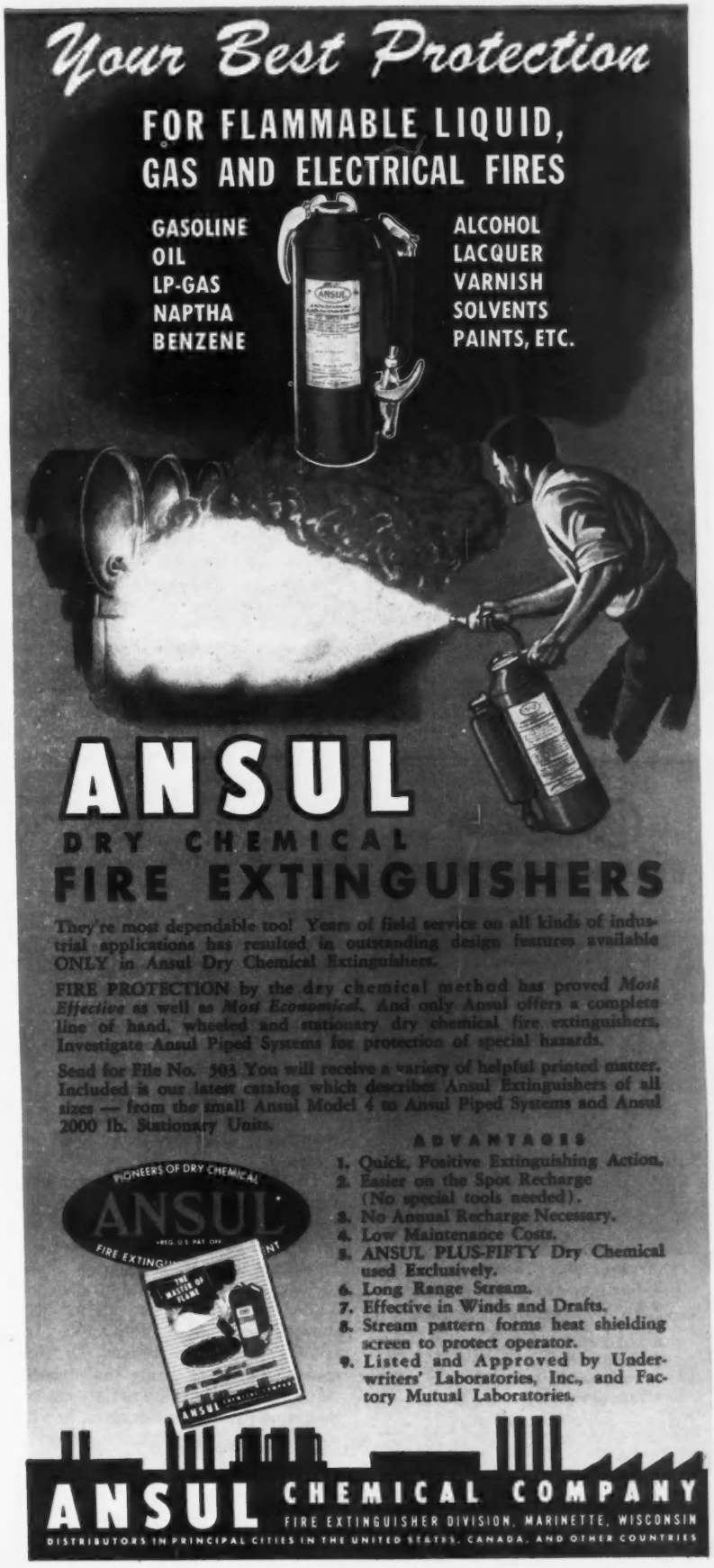
OXYGEN TENTS
Reprinted from Recommended Practices on Anesthetic Gases and Oxygen in Hospitals, National Fire Codes, Volume I, 1948.

Fluorescent Paste Available for Detecting False Alarmists

COMMUNITIES troubled with an abnormal series of false alarms from fire alarm boxes might find the fluorescent paste method of detection and identification of the guilty parties of value. The Cincinnati Fire Department uses the paste on the "hooks" or operating levers of fire alarm boxes and has equipped the cars of chief officers with a special type of "black lamp" which will make the fluorescent paste glow if on the hands of a suspect brought before the lamp.

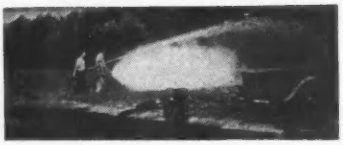
The photograph shows a Cincinnati fire marshal applying the lamp from his car to the hands of a suspect. The car is equipped with an over-sized generator and transformer to provide the 110 volt AC current required by the lamp, but any 110 volt AC circuit would be satisfactory.

The equipment is manufactured by the National Marking Machine Co. of Cincinnati who caution that the availability of the fluorescent paste and identification lamps should not be broadcast to the general public in areas where the fire department plans to use this means of detection. In one or two instances newspaper publicity has spoiled much of the surprise value of this method of identification and false alarmists have been careful to avoid physical contact with the alarm box hook.


Your Best Protection
FOR FLAMMABLE LIQUID, GAS AND ELECTRICAL FIRES
GASOLINE
OIL
LP-GAS
NAPTHA
BENZENE
ALCOHOL
LACQUER
VARNISH
SOLVENTS
PAINTS, ETC.
ANSUL
DRY CHEMICAL
FIRE EXTINGUISHERS
They're most dependable too! Years of field service on all kinds of industrial applications has resulted in outstanding design features available ONLY in Ansul Dry Chemical Extinguishers.
FIRE PROTECTION by the dry chemical method has proved Most Effective as well as Most Economical. And only Ansul offers a complete line of hand, wheeled and stationary dry chemical fire extinguishers. Investigate Ansul Piped Systems for protection of special hazards.
Send for File No. 503 You will receive a variety of helpful printed matter. Included is our latest catalog which describes Ansul Extinguishers of all sizes — from the small Ansul Model 4 to Ansul Piped Systems and Ansul 2000 lb. Stationary Units.
ADVANTAGES
1. Quick, Positive Extinguishing Action.
2. Easier on the Spot Recharge (No special tools needed).
3. No Annual Recharge Necessary.
4. Low Maintenance Costs.
5. ANSUL PLUS-FIFTY Dry Chemical used Exclusively.
6. Long Range Stream.
7. Effective in Winds and Drafts.
8. Stream pattern forms heat shielding screen to protect operator.
9. Listed and Approved by Underwriters' Laboratories, Inc., and Factory Mutual Laboratories.
PIONEERS OF DRY CHEMICAL
ANSUL
ANSUL CHEMICAL COMPANY
FIRE EXTINGUISHER DIVISION, MARINETTE, WISCONSIN
DISTRIBUTORS IN PRINCIPAL CITIES IN THE UNITED STATES, CANADA, AND OTHER COUNTRIES

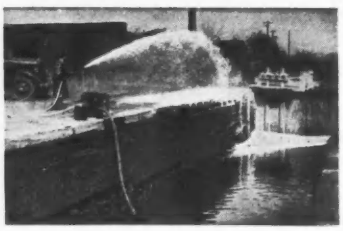
HALE TYPE FZZ

Ready-to-Use Portable Pump for fighting fires 3 ways: Solid Stream, Fog, or Foam



FZZ Portable Pumping Unit above is pumping fog and solid stream through 1½" lines. View below shows unit pumping foam. Foam proportioner available at slight extra cost.

The FZZ will supply from draft, 60 GPM at 90 lbs. pump pressure; and 150 GPM at 30 lbs. Can supply two capable streams through 1½" lines, using nozzle tips up to ½".



Available in carrying frame; mounted on wheels; or on rubber-cushioned steel channels. Can be mounted or carried on virtually any equipment for fighting brush fires while in motion using booster tank for water supply.

Write for new FZZ folder to:

HALE FIRE PUMP COMPANY

Conshohocken, Pa.

CIRCULAIR

FIRE HOSE DRYER

- Dries hose in a few hours
- Saves space — fits in any corner
- Keeps all hose ready for service
- Makes good hose last longer
- Reduces new building costs
- Improves station design
- Dries fire clothing, too

WRITE FOR FREE CATALOG

THE CIRCULAIR CORPORATION
575 East Milwaukee Street
DETROIT 2 ◇ MICHIGAN

Retirements Announced by National Board of Fire Underwriters

TWO outstanding authorities in fire prevention and fire protection retired from long service with the National Board of Fire Underwriters on January 1. They are: George W. Booth, Chief Engineer for a period of 39 years and T. Alfred Fleming, Director of Conservation.

Mr. Booth is an honorary life member of NFPA and a former member of the NFPA Board of Directors. He has been active in numerous NFPA committees for some forty years.

Mr. Fleming, as Director of Conservation, has been an evangelist for fire prevention since he attended the Lakewood Grammar School fire in Collingwood, Ohio, on March 4, 1908. One hundred and seventy-five children and teachers perished in that blaze. Mr. Fleming, trained as a clergyman, began a militant campaign for fire safety. As State Fire Marshal in Ohio he obtained a national reputation which brought him to the National Board as Director of Conservation some 30 years ago. Few among the thousands of firemen throughout the United States and Canada who have had opportunity to hear Mr. Fleming address fire schools and other gatherings will ever forget the forcefulness, eloquence and sincerity of his message.

Mr. Fleming served as Chairman of the NFPA Committee on Fire Prevention and Clean-up Campaign and its predecessor, the Committee on Fire Prevention Day and Week, since 1921.

Firemen Lose a Good Friend

DR. E. G. STILLMAN of 45 East 75th St., New York City, an NFPA member since 1925, passed away on December 16. Dr. Stillman was one of the best known fire buffs in the New York City area and had one of the largest collections of motion pictures on fire subjects, including many in color. He had appeared on hundreds of fire school and other fire department programs.

Dr. Stillman financed a number of inventions relating to fire fighting, contributed to funds for medals for hero firemen, installed a bronze memorial to New York City firemen killed in the line of duty, financed electrical maps in New York and Brooklyn fire alarm offices showing locations of fire stations. An ardent fire alarm enthusiast, Dr. Stillman not only visited fire alarm central stations but devised a wrist attachment that would give him fire alarm box impulses from a fire alarm circuit in his home even when he was in bed.

An excellent tribute to Dr. Stillman appeared in the "Fire Crackers" column of THE CHIEF, New York Civil Service Newspaper, for December 23.

FIREMEN'S UNIFORMS

SHIRTS
BADGES
CAPS
INSIGNIA

Manufacturers of Uniforms for over 50 years

Official Makers of Uniforms for New York City Fire and Police Departments, and Serving Other Departments from Coast to Coast.

RUSSELL UNIFORM CO.
192 Lexington, New York 16, N. Y.
Corner 32nd Street: Phone MU 6-0828
Write for Fire Dept. catalog H-60

Luverne

FIRE TRUCK EQUIPMENT

500 and 200 gallon Pumpers

INSTALLED ON
MODELS F-5, F-6, F-7
FORD TRUCKS

For details and quotations see any Ford Dealer or write to

LUVERNE FIRE APPARATUS CO.
Luverne, Minnesota

Manufacturers of Fire Truck Equipment Since 1912

Whittier Jr. High School Fire

(*Continued from page 15*)

or through a chained gate at 11th Street.

The first engine located at this hydrant and the first line was stretched through the front door, after forcing entry, and up the stairway to the doorway of room 209. All lines were fitted with current models all-purpose fog nozzles. A second line was stretched simultaneously via the rear door up the stairway to a point alongside the first line. The doors to rooms 208 and 209 were then forced and a quick burst of fog made entry possible and the lines were taken in so as to be under the fire.

Flames had already burned through the ceiling of 209 so that the major fire which completely involved the attic was visible. This was attacked first from the classroom floor level using fog with good local success. However, it was soon apparent that fast action would be necessary to reach the main portions of the attic or we would have to abandon our offensive position and go on the defensive. Accordingly, two 1½-in. all-purpose leader lines were called for and these were put on the first 2½-in. line, using a hose clamp. A short ladder was raised through the ceiling of room 209 and both lines were sent aloft with the nozzlemen fighting as they progressed. By careful use of these lines on fog-position only, the fire seemed to miraculously fade away so that in a very short time it was in the overhauling stage.

Overhauling consumed considerable additional time due to the special treatment that had to be accorded the roof. The composition roof had been laid over the old wooden shingle roof and each wooden shingle had to receive individual care to see that all fire was out. In spite of great care in the application of water a considerable quantity drained down to the basement but not before our salvage company had all fixtures adequately covered. The department's 3 KW light plant was employed shortly before the overhauling stages and was used throughout the salvage operations.

Other 2½-in. lines were employed on the fire from the outside. A third 2½-in. line was stretched from Engine 1 and used for a short time from the football field south of the building. This was the only solid stream used and was directed on the roof where considerable fire was breaking through and was effective in blacking out this position. Only one 2½-in. line was stretched from Engine 2. This was taken to the west side, wyed with two 1½-in. leader lines with all-purpose fog nozzles. These were taken up the vertical firemen's ladder to the roof and used in overhauling. Another 2½-in. line stretched from the pump on Truck 1 just in case, was not

(*Continued on page 30*)

NEW!

C-O-TWO

DRY CHEMICAL TYPE FIRE EXTINGUISHER

EXCLUSIVE DESIGN

assures you of fast, positive fire protection

SELF-CONTAINED UNIT . . . rugged construction . . . no extra gadgets protruding or complicated operating parts . . . one of the most efficient, foolproof, easy-to-use fire extinguishers known . . . two convenient sizes, 20 pound capacity and 30 pound capacity.

C-O-TWO DRY CHEMICAL STAYS FREE FLOWING . . . no syphon tubes or valves within the cylinder to become clogged or inoperative . . . discharge hose and squeeze type discharge nozzle remain empty until the fire extinguisher is actuated. Inverting the fire extinguisher before using provides mechanical breakage by changing the position of the dry chemical in the cylinder. Bumping to actuate the fire extinguisher provides additional mechanical breakage as well as continuous carbon dioxide gas pressured agitation or fluffing of the dry chemical. These combined features plus a skillfully blended free flowing extinguishing agent assure you of a faster, more effective and complete discharge.

APPROVED . . . Underwriters' Laboratories, Inc. rating is B-1, C-1. C-O-TWO Dry Chemical is non-conducting, non-corrosive, non-abrasive, non-freezing and non-toxic . . . highly effective on flammable liquid and electrical fires.

RECHARGEABLE ON-THE-SCENE . . . no special tools needed . . . one piece removable top assembly leaves large unobstructed opening in the top of cylinder for refilling. C-O-TWO Dry Chemical for recharging is available in handy pre-measured moisture proof containers.

Write today for complete free information on this new, quick-acting fire extinguisher . . . no obligation.

C-O-TWO FIRE EQUIPMENT COMPANY

NEWARK 1 • NEW JERSEY

Sales and Service in the Principal Cities of United States and Canada

AFFILIATED WITH PYRENE MANUFACTURING COMPANY

The Original MIDWESTERN Yellow Striped Safety Coat Is Again Available . . .

Here's Protection and Comfort in Your Hazardous Work of Safeguarding Life and Property Against FIRE!

Modern fire fighting calls for *specialized* protective clothing . . . clothing that safeguards the fireman's life on every run . . . clothing that enables him to use his equipment to the fullest advantage.

Every Midwestern product combines the thoughts and suggestions of practical Fire Chiefs and firemen from every section of the country . . . and every purchaser profits from years of Midwestern research and experience. That is why the famous Mackinaw Coat and other Midwestern clothing have embodied in their design every feature necessary for the protection and comfort of firemen.

In our vast selection of crude rubber materials you will find a type of fabric suitable for your climate and needs. The softness and flexibility in the high-grade materials used are your assurance of long time service and comfort. Many Fire Chiefs are now including Midwestern clothing in their regular yearly budget and by placing your order early you can be assured of this adequate protection when needed.

For complete information have your Midwestern dealer show you our new garments now manufactured from crude rubber compounds. A letter to the factory will also bring you material samples for your inspection.

We now have available: White, Ivory and Brown crude rubber coats for Chiefs, Assistants and other officers: also all sizes short and ¾ length felt lined Firemen's boots for immediate shipment.

NONE GENUINE WITHOUT THIS TRADE MARK

MIDWESTERN MFG. CO. MACKINAW ILLINOIS

Manufacturers of the Famous **MACKINAW Coats**

THE *New* **Beacon Ray Light**

Extra VISIBILITY . . . from every angle
Beacon Ray beams rotate through full 360°

Extra STRENGTH . . .
Beacon Ray emits two powerful signal beams (180° apart)

Extra 360° PROTECTION . . . running or parking
Full rotation provides "area warning" regardless of vehicle position.

Federal Enterprises' new Beacon Ray Light is Extra in every respect. New through and through, this advanced design warning light is an entirely new concept in effective signalling equipment.

Your vehicle will be safer with Beacon Ray Write today for full particulars

FEDERAL ENTERPRISES, INC.

Formerly: FEDERAL ELECTRIC COMPANY, INC.

8717 S. STATE STREET · CHICAGO 19, ILLINOIS

Firemen Go to the Schools

(*Continued from page 15*)

"For a period of four years we had some 387,000 fire hazards corrected in the homes. And if you figure that only 1 out of 10 of these turned out to cause a building fire in a city where our average fire loss is $187 per building, the total loss would have been about $7,000,000.

"Another way we can measure the success of this work with our youngsters is by the actual fire loss figures. Last year there was a $167,000 smaller loss over the preceding year and our average dwelling fire loss in Los Angeles alone is about a half-million dollars.

"This program ties in to the Arson Bureau's work in trying to discourage juvenile arsonists. Since this program has been in effect, last year, there were only 322 fires set by children with matches. The year before that there were about 480, which is better than a 25 percent reduction.

"On false alarms, we find in Los Angeles that out of 23,000 alarms about 95 percent of them come in by telephone and of the 5 percent that come in by box, 8 out of 10 are false. Of those false alarms half of them can be attributed to children. We have found that since the institution of this junior fireman program that false alarms attributed to children have been reduced one-third."

On our side of the country — in Boston — fire prevention work with the youngsters has been equally successful. During the first year of the operation of a junior fireman program in Boston, 50,000 fire hazards were corrected by boys and girls at the 6th grade level alone.

Of course, these are experiences of two large cities. But I think that juvenile education projects in smaller communities would be even more successful because the team spirit has more of a chance and is stronger in smaller communities.

I can honestly think of no other fire prevention feature that will return your fire department more concrete good for the effort expended than working with the youth of your communities on the local fire problem. It is not expensive, it shouldn't take a prohibitive amount of time, but if you sit down with your local school officials and work out a comprehensive, long-range fire prevention program with them, I know that you will find it to be one of your most potent forces in vanquishing needless fire and thus make your community a better place in which to live.

FOR SALE

One 1926 American La-France City Service Hook and Ladder Truck. Early 1950 delivery. Full complement of ladders to 50 ft., extinguishers, hand tools, etc. Excellent appearance. If interested, communicate with

A. P. Smith, Town Clerk
210 Main St., Boonton, N. J.

Read What Users Say About
INDIAN FIRE PUMPS!

ACTUAL UNSOLICITED TESTIMONIALS TAKEN DIRECTLY FROM OUR FILES

AGENTS WANTED

"Never Saw So Much Fire Extinguished with So Little Water!"

A rancher phoned for help to fight a prairie fire. The Fire Chief and I took 2 ***INDIAN FIRE PUMPS*** *and were able to extinguish the fire as fast as we could walk. Flames were from two to four feet high driven by a strong wind.*

Best of all we still had water left in both five gal. tanks. ***INDIANS*** *sure do a great job.*

W. H. Burden, Councilman

"Saved the House with INDIAN FIRE PUMPS!"

Two of your ***INDIAN FIRE PUMPS*** *held a fire in my home in check until the fire truck from Augusta made the run out into the country 7-1/2 miles and saved the house.*

The ***INDIAN*** *did great work holding the fire in check and is a wonderful fire fighter.*

Mrs. Jennie J. Brackett

If you, too, have used INDIAN FIRE PUMPS to advantage why don't you tell us about it? We would like to hear from you.

"Uses INDIANS More Than Any Other Equipment!"

Rush four No. 90B solid brass ***INDIAN FIRE PUMPS*** *and four carrying racks for mounting.*

We have several of these pumps now and are adding more because we use ***INDIANS*** *more than any other equipment in our department.*

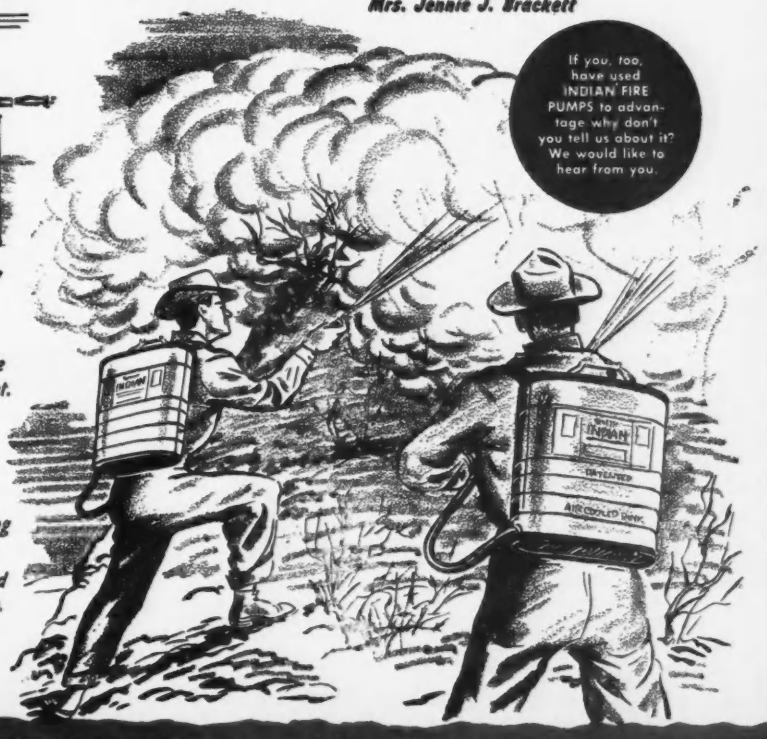
J. S. Allensworth *Fire Chief*

"INDIAN FIRE PUMPS Very Successful!"

Your ***INDIAN FIRE PUMP*** *has been very successful in extinguishing fires beyond the reach of the booster line of our fire patrol jeep.*

On one occasion the fire had dropped over the edge of a cliff and it was necessary to climb the face of the cliff to put out the fire. As the ***INDIAN*** *could be back packed there was no difficulty in climbing to the spot fires and extinguishing them.*

Timothy G. Stillman
Fire Protection Laboratory



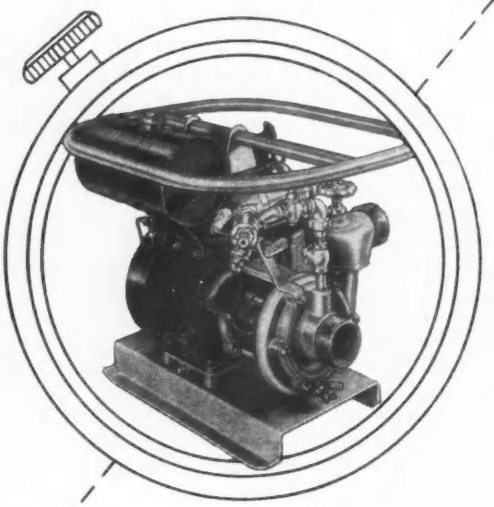
FOR DESCRIPTIVE INFORMATION ON THESE FAMOUS FIRE EXTINGUISHERS WRITE TO

D. B. SMITH & CO. UTICA 2, N. Y.

PACIFIC COAST BRANCHES:

CANADIAN AGENTS:

COMPACT as a watch!



THE compactness of this 3XC booster pump makes it easy to carry on your truck any place.

Delivers 300 GPM to booster tanks. Ideal for pumping out basements—handling dirty water without damage, thus saving wear on your expensive equipment. When connected to booster tank can be used to fight grass fires with truck in motion.

• • •

We are also the manufacturers of the Barton-American Front and Mid-ship Mounted Fire Pumps.

AMERICAN-MARSH PUMPS

BATTLE CREEK MICHIGAN

In Canada:
C. E. HICKEY & SONS, Ltd., Hamilton, Ont.

You know how to operate this extinguisher JUST BY LOOKING AT IT!

Simple, *obvious* operation makes the Randolph really panic-proof—gets it into action *before* the fire spreads—kills fire instantly with a snowy cloud of CO_2! No valves to turn, no nozzles to adjust; just point and press your thumb! Randolph CO_2 is non-damaging, evaporates without a trace. It's non-toxic, won't conduct electricity, deteriorate or freeze. UNDERWRITERS' APPROVED.

Learn how Randolph gives your plant better *preventive* fire protection! Write or wire:

RANDOLPH LABORATORIES, INC.

5 EAST KINZIE STREET • CHICAGO 11, ILLINOIS

Radio Frequency Allocations

(*Continued from page 19*)

excess of 10,000 population will use the 152–162 Mc frequencies (see map).

In a system or city using the higher frequencies, conditions, load, area, etc. must be taken into consideration. Maryland cities, except Baltimore, can successfully operate a simplex or single frequency system to good advantage. If some of the smaller cities should care to join into a coordinated mutual aid system on the county frequency in lieu of operating in the 152 Mc band, no objection would result.

All firemen realize the importance and advantages to mutual aid in having a central point knowledge of the fire situation in any country and of having finger tip information as to the availability of equipment and apparatus needed by the various chiefs in time of large fires or disasters.

Under the country plan (with each department having its own main station and mobile units plus the walkie-talkies) such a system could very easily be established at any time at the most desired location.

After all departments have their own systems the only other equipment necessary for coordination and for the establishment of the plan would be the installation of a base station transmitter and receiver with sufficient personnel to man the station at all times.

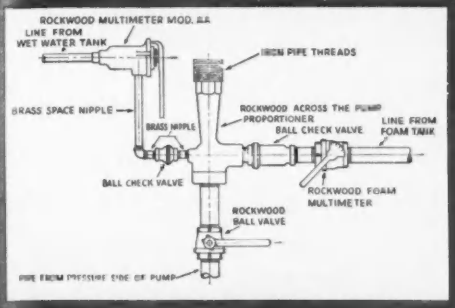
It is desirable to point out that once a radio system is installed in any department, an operating procedure must be established. A unit responding, preferably a pump operator on initial alarms (in the absence of a radio equipped chief's car) shall be designated "Communications Unit." This unit will act as laison or contact point for all messages between the fire grounds and headquarters. The chief or officer in charge should use this as a field headquarters. On large fires or multiple alarms a fire officer should assume this communications assignment and coordinate all operations.

This should also be the point of operation between pack-sets operating on the fire grounds. The communications method should be practiced like any other fire department procedure so that when disaster or large fires occur it will be well established.

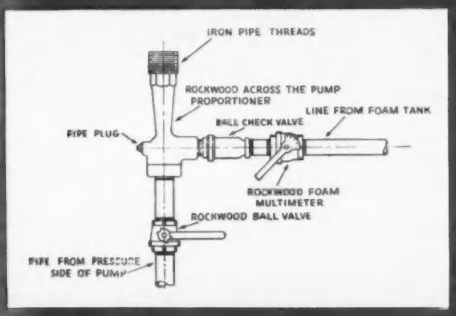
In applying the frequencies, fire departments regardless of size can proceed as they see fit to equip their respective departments. There is no need to wait on an entire county to provide a station and dispatcher. Many times the smaller departments by virtue of their size, can become financially able to proceed before the larger.

Next month a radio frequency allocations plan will be presented for the State of Virginia.

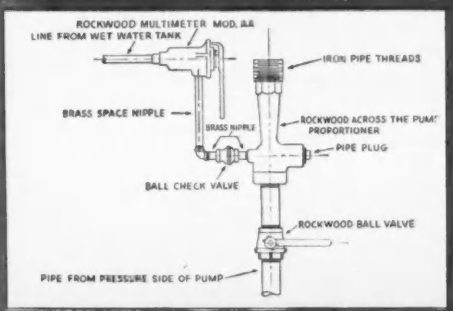
HOW TO AUTOMATICALLY FEED FOAM LIQUID OR WETTING AGENTS INTO YOUR FIRE HOSE LINES



1. Rockwood Across Pump Proportioner Model Dual B for FOAM and WET



2. Rockwood Across Pump Proportioner Model Dual B for FOAM ONLY



3. Rockwood Across Pump Proportioner Model Dual B for WET ONLY

3 NEW ROCKWOOD AUTOMATIC PROPORTIONING UNITS THAT WILL PAY FOR THEMSELVES

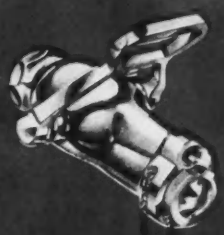
This simple and most accurate way to feed FOAM liquid or Wetting agent into your fire hose lines is also the *least expensive* — and it is entirely *automatic*.

No longer is it necessary to pour these liquids into a booster tank in a hit or miss fashion. You can now use these only when you need them. A simple turn of a metering valve automatically mixes the right amount of Wetting agent or FOAM liquid with water — without guesswork.

Here are three new Rockwood Automatic Proportioning units. One provides automatic proportioning for both FOAM liquid and Wetting agent, another is for FOAM liquid only and the third kit automatically proportions wetting agent only. All three kits are shown at left. They are known as the new type B Rockwood Across-the-Pump Proportioners.

If you are planning to buy a new fire truck, be sure to specify one of these new Rockwood proportioners. They can also be added to the fire trucks you now have in service. Write for complete operating and installation data and prices.

To put out fires faster and more economically use Rockwood Foam Liquid with the new Type FFF Rockwood Fog-FOAM Nozzle.



The most efficient way to apply a wetting agent to most fires is thru a type SG-48 Rockwood Triple-action WaterFOG Nozzle.

ROCKWOOD

ROCKWOOD SPRINKLER COMPANY

88 HARLOW STREET WORCESTER 5, MASSACHUSETTS

Specialists in Fire Protection Engineering, Equipment and Installation since 1907

FIREFLY

License Plate Signs

LAS VEGAS FIRE DEPT. TYPE D

24 Hour Visibility

PLEASANT VALLEY FIRE DEPT. TYPE C-2

SPRINGFIELD FIRE DEPT. TYPE E

.064 Aluminum 4" x 10"

Also: Fire Chief, Asst. Fire Chief, Fire Dist., Fire Police, Fire Capt., Fire Lieut., Fire Warden, and Fire Marshal *in any type -- at the same Price.*

Featuring

VISIBILITY- DURABILITY- LEGIBILITY

"SCOTCHLITED"

12 or More, any type 90c ea.
Less than 12 $1.00 ea.

Cash—C.O.D.—or End of Month

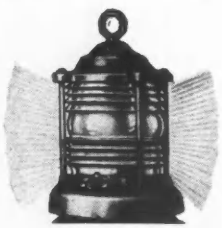
PACIFIC REFLEX SIGNS
Box 323, McMinnville, Oregon

CARPENTER LIGHTS

360 DEGREES

Red Flashing Light

LONG-RANGE VISIBILITY



For mounting on cab roofs of snow plows, trucks, buses, repair cars and emergency vehicles of all types. Available with or without built-in flasher and in 3½ in. or 4½ in. lens. Also available with Blue, Amber, Green or White lens, or combination 240 degree Red (for rear) and 120 degree Amber or Blue (for front) or other combinations. Visible from any angle.

Write for new Emergency Lighting Folder.

CARPENTER MFG. CO.
168 Master-Light Bldg.
BOSTON—45—SOMERVILLE
MASSACHUSETTS

Volunteer Fire Company Section

Membership in the NFPA Volunteer Fire Company Section costs $12.50 per year. This includes 10 subscriptions to FIREMEN. Additional fire fighters may be enrolled to receive FIREMEN at $1.25 each. Other NFPA members will be sent FIREMEN on request.

Every member receives a handsome membership certificate illustrating the history of fire protection.

THE Volunteer Fire Company Section of the National Fire Protection Association has twelve new members for the month of February. These companies have a total of 150 men receiving FIREMEN.

At the present time, there are 1396 companies in the Section with a total of 20,939 men enrolled.

New members of the Section are:

Anza Village Fire Dept., Arlington, Calif.
Bow Vol. Fire Dept., Concord, N. H.
Cameron Fire Dept., Cameron, Mo.
Camrose Fire Dept., Camrose, Alta.
Citronelle Vol. Fire Dept., Citronelle, Ala.
Cooper Twp. Fire Dept., Kalamazoo, Mich.
Genoa Fire Dept., Genoa, Ill.
Hobe Sound Fire Dept., Hobe Sound, Fla.
Norwood Fire Dept., No. 1, Norwood, N. J.
Pompton, Vol. Fire Dept., Riverdale, N. J.
Redding Vol. Fire Dept. No. 1, Redding Ridge, Conn.
Washington Vol. Fire Dept., Washington, R. I.

VOLUNTEER FIRE COMPANY SECTION MEMBERSHIP

($12.50 annual dues) Eligible:

(1) all bona fide volunteer fire organizations in any community.

(2) all fire departments and companies in communities of less than 25,000 population.

(3) all industrial fire brigades.

Member companies receive ten copies of FIREMEN magazine each month, mailed to the homes of individual firemen. Beyond the ten, additional copies of FIREMEN cost $1.25 per year.

Volunteer Fire Company Section members receive at their headquarters, one copy of all publications sent to NFPA individual associate members.

INDIVIDUAL ASSOCIATE MEMBERSHIP

($12.50 annual dues) Eligible:

Individual fire departments, officers, firemen, and others interested in fire safety. NFPA associate members in the fire service receive: one copy of FIREMEN magazine monthly, the NFPA Quarterly, the monthly Fire News, technical standards, popular bulletins and posters.

All associate members have one vote in Association affairs.

"Listen to the fire engines, I feel sorry for the poor firemen on a cold night like this."

When Seconds Count... Quality Comes First!

GENERAL

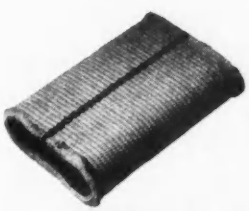
BWH

DEPENDABLE RUGGEDNESS

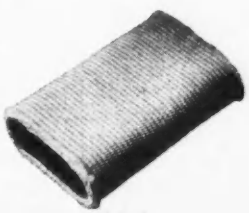
Your community never had a bad fire? The old fire hose will do another year? Maybe so. But don't push your luck too far. One rip-roaring blaze would cost plenty more than the saving you make by pinching on fire equipment.

With BWH Fire Hose, no time is lost in getting water on a fire. It's lightweight, handles easily on the ground or on ladders. Flat cured to fold quickly and compactly in the truck bed. And when it comes to toughness, you can't beat BWH Hose for pressure resistance, year in, year out, hard service and ability to take punishment

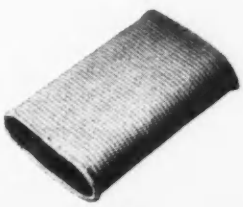
Look for the "General" trademark in the classified section of your phone book. Let this organization of Fire Equipment experts tell you more about the BWH 72-year leadership in the fire hose field.



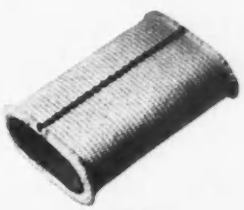
BWH
"BOSTON FIRE JACKET" HOSE
Double Jacket
Heavier, stronger fibers, perfect adhesion, smooth, friction-resistant waterway. Rates tops in every test!



BWH
"PARAMOUNT" HOSE
Double Jacket
Designed for easy handling and long service on tough jobs. Ages well, withstands high pressures.



BWH
"MILO" HOSE
Single Jacket
For long, trouble-free performance in communities where a light service hose is adequate.



BWH
"UNDERWRITERS" HOSE
Single or Double Jacket
Made in strict accordance with the National Board of Fire Underwriters' specifications. Labeled or unlabeled.

Distributors of famous

BOSTON WOVEN HOSE AND RUBBER CO.

Municipal Fire Hose

THE GENERAL DETROIT CORP.

DETROIT 7, MICHIGAN

NEW YORK • ATLANTA • CHICAGO • DALLAS

Subsidiary:

THE GENERAL PACIFIC CORP.

LOS ANGELES • SAN FRANCISCO • SEATTLE

CAIRNS

Outfitters to Firemen Since 1836

We offer you the most complete and diversified line of Fire Helmets in America, with over a century of experience as a guarantee of superior quality and maximum value.

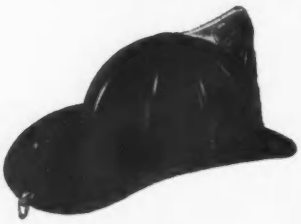
←THE "NEW YORKER"
The toughest, strongest, most durable helmet made; the "regulation" standard wherever leather helmets are preferred.

THE "SENATOR" →
A superior one-piece aluminum helmet in "regulation" style; light, strong, durable, will not shrink or lose its shape.

THE "CLIFTON" ↓
The new Flintflex replica of the famous "New Yorker"; the most rugged and durable plastic helmet on the market; "regulation" in every line, with standard front.

We offer a PERSONAL SERVICE to firemen, giving special attention to individual needs or preferences as to unusual sizes and shapes, special front pieces, etc.

Write for Catalog 330



CAIRNS & BROTHER
(ALLWOOD), CLIFTON, N. J.

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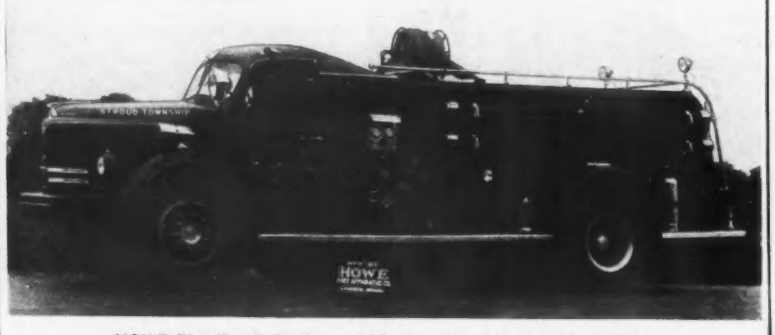

HOWE Fire Truck Equipment Meeting Every Service Since 1872
Centrifugal, Rotary and Piston Pumps supplied
HOWE FIRE APPARATUS COMPANY, 1406 West 22nd Street, Anderson, Indiana

Whittier Jr. High School Fire

(*Continued from page 23*)

needed. The truck was connected to the same hydrant as Engine 1.

A thorough knowledge of the arrangement and construction of this school building by all of our fire department officers, gained during inspections and later blackboard talks, was mainly responsible for the success in controlling the fire. Skill and confidence installed in our officers and firemen in the use to the maximum possible advantage of our fog nozzle equipment made this knowledge successful. The training of efficient salvage crews that can proceed in this vital operation without being told to by the chief officer resulted in major savings to the property from water damage, particularly in the basement printing shop where high value linotypes and presses were located.

The building was currently appraised at a depreciated value of $73,718 but with a replacement cost of better than $250,000. The insurance loss was adjusted to $15,940.13. It was totally covered by insurance.

MANUFACTURERS' ANNOUNCEMENTS

Randolph "6" Announced

DEVIATING from its standard four and five pound sizes, Randolph Laboratories, 8 E. Kinzie St., Chicago, Ill., has produced a six pound carbon dioxide fire extinguisher. The "Randolph 6" features the thumb-trigger release and self-aimed nozzle. Only one hand is required for operation. With no valves or nozzles to adjust, it is claimed to be completely panic proof.

The extinguisher is especially adapted to smother flammable liquid and electrical fires. It is approved by Underwriters' Laboratories.

Additional information may be obtained by writing to the manufacturer.

New Device for Drying Boots

THE Mann Engineering Co., 429 Penn Ave., Pittsburg 22, Pa., has developed a device that is claimed to reduce the time required to dry the inside of boots, and prolong the life of the boots. Made of light, corrosion-resistant aluminum, the "Boot-Vent" consists of a leg plate and foot plate hinged together. Insertd, it provides a partition which permits air circulation. Heat from the sun, or any kind of heater will warm the air and set it in motion. It is designed for use in all boots, sizes 8–12.

Here's how MACK helps you get... new apparatus

• Yes, Mack is telling public-spirited citizens in your own community of your continued need for new apparatus – showing them how they can thus help strengthen their fire protection. Powerful advertising messages like this two-page spread will appear throughout the year in such leading national magazines as *Saturday Evening Post, Fortune, Time, Newsweek* and *Business Week* – another evidence of Mack's continued cooperation in working for the betterment of the nation's fire service.

Reprints of these advertisements are available to help in your campaign to replace obsolete or inferior equipment. Just let us know how many you require, or see your Mack representative.

This colorful double-page advertisement calls public attention to the need for systematic programs of fire apparatus replacement. Look for it and others in leading magazines, or get your free copies – as many as you need.

American FIRE APPARATUS ON THE MOVE!

THE American Fire Apparatus "Tanker" truck really goes to the fire. Equipped with the new *frost proof* Barton-American UA-50 front mounted fire pump producing effective fog streams while the truck is in motion. A feature not possible with other type pumps.

The "Tanker" can be built on any commercial chassis and is advance engineered for performance durability, service and maneuverability. Designed for maximum water carrying capacity, and meets all Underwriters' requirements. Makes an effective metropolitan unit as well as being ideal for rural protection.

The "Tanker," like our "Pumper" (with the BARTON-AMERICAN DUPLEX-MULTISTAGE midship fire pump), is equipped with two Barton Super-fog guns. (See box below.)

500 GPM PUMPING CAPACITY

Barton Super-fog is the result of several years of research. It is a highly developed fog system producing long and short range fog streams and powerful straight streams at safe high pressures. Built around both the Barton-American front and midship fire pumps.

"Super-fog" is the most effective fire fighting stream yet produced.

We invite your inquiry.
Descriptive literature available.

American
FIRE APPARATUS

DIV. AMERICAN-MARSH PUMPS, INC.
BATTLE CREEK, MICHIGAN